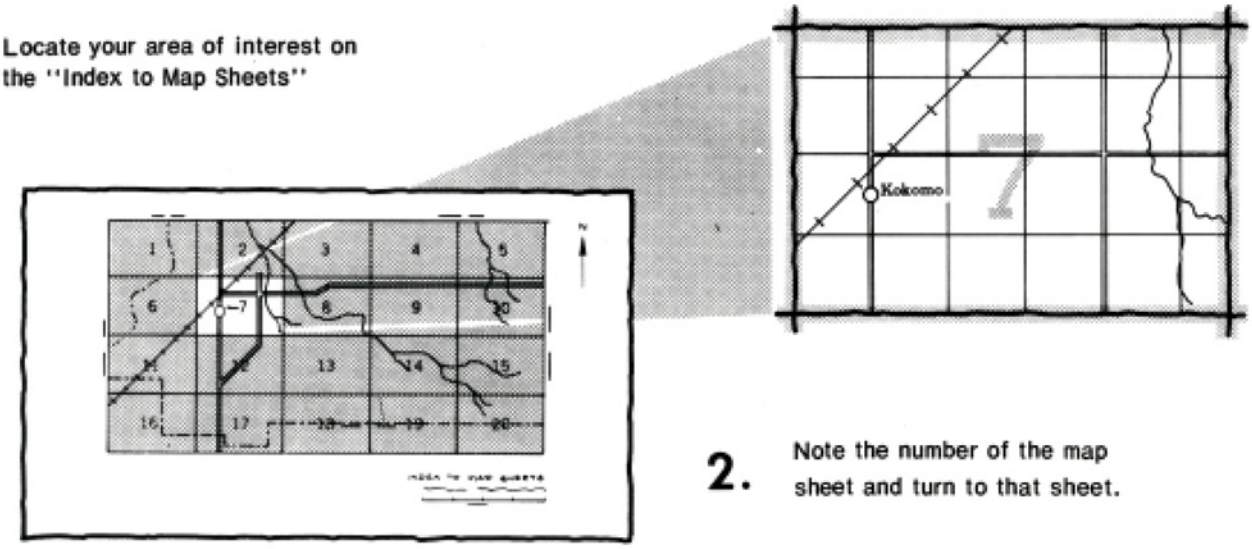
United States Department of Agriculture
Soil Conservation Service
in cooperation with
Connecticut Agricultural Experiment Station and
Storrs Agricultural Experiment Station

Soil Survey of Windham County Connecticut

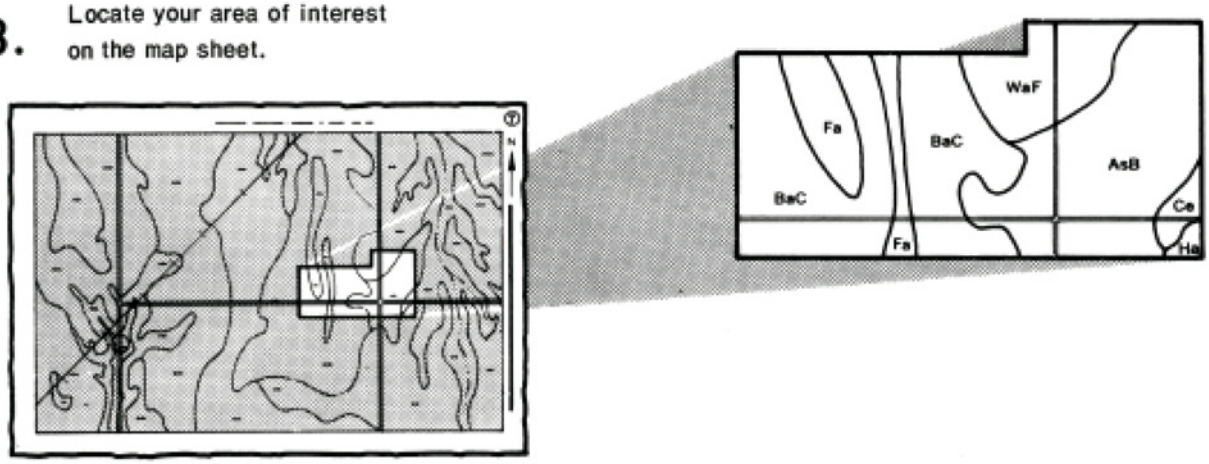
HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets"

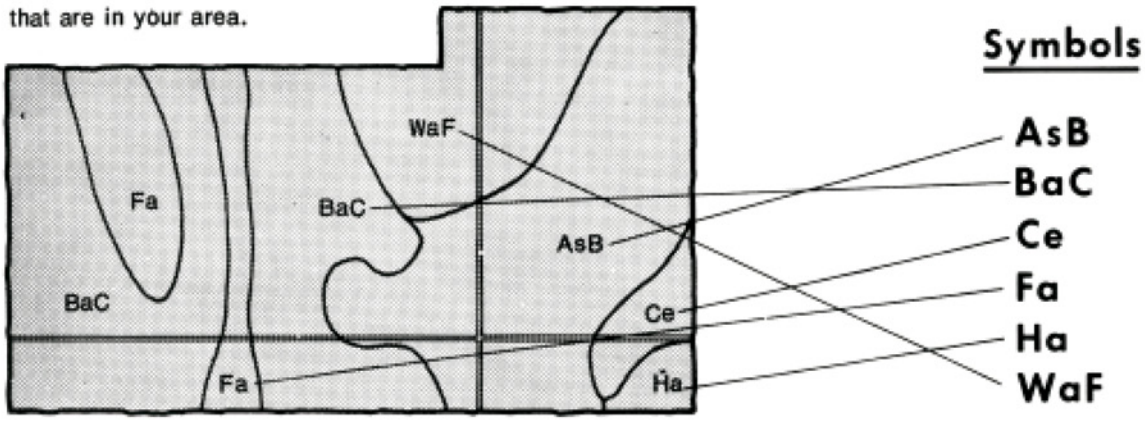


2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.

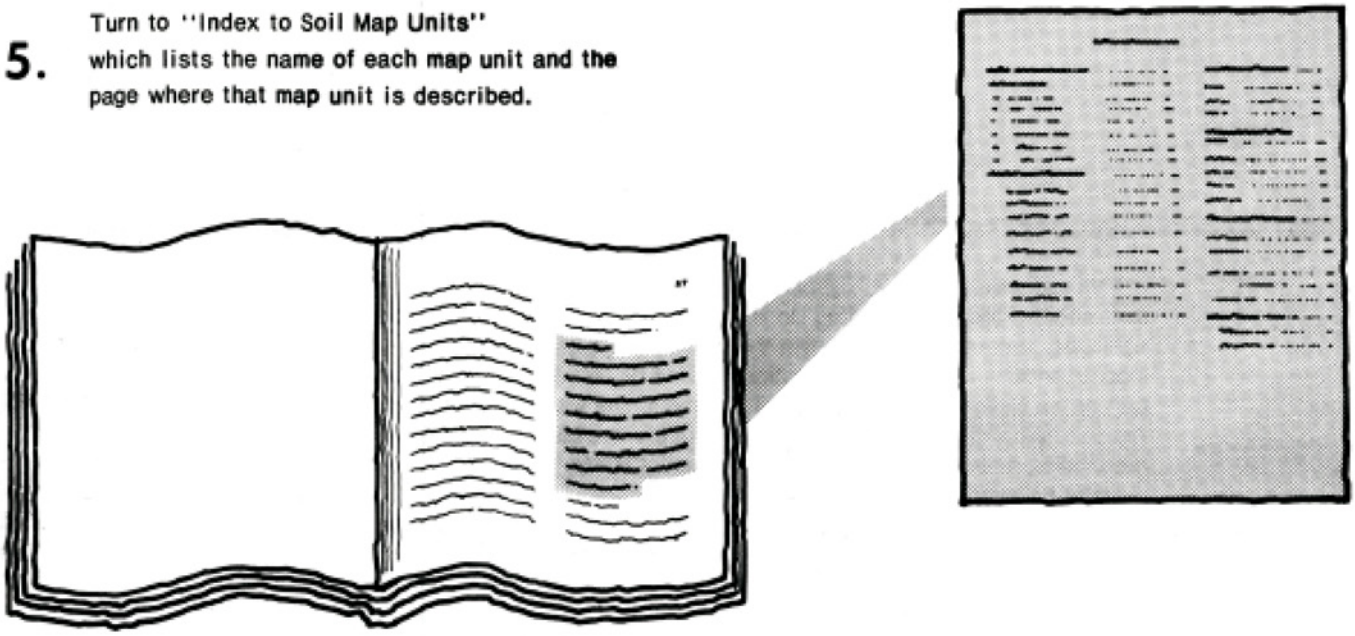


4. List the map unit symbols that are in your area.

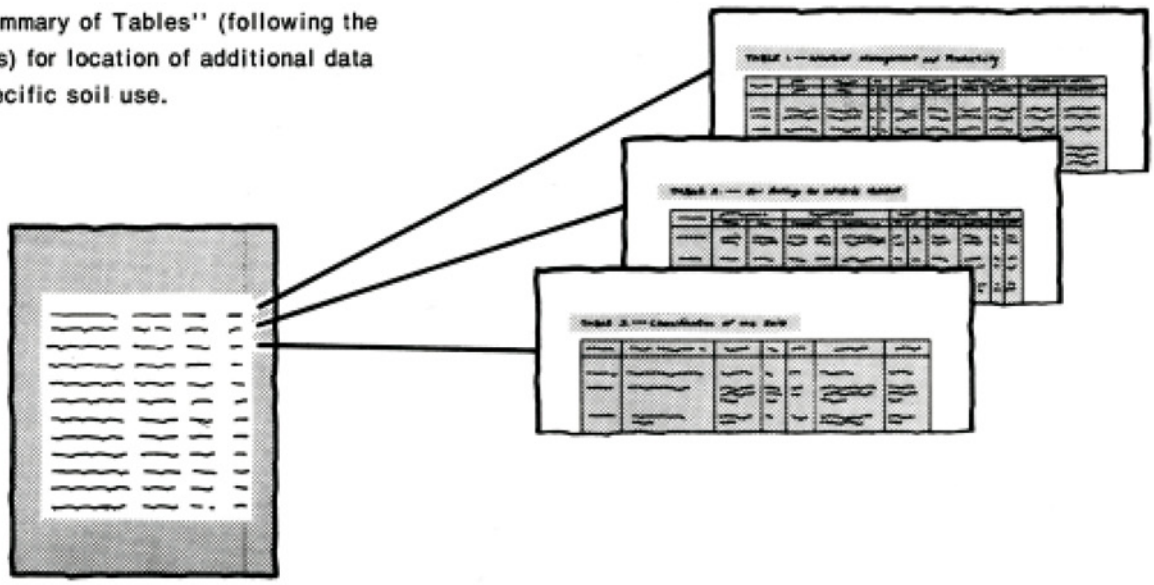


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was performed in the period 1967-79. Soil names and descriptions were approved in 1980. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1980. This survey was made cooperatively by the Soil Conservation Service, the Connecticut Agricultural Experiment Station, and the Storrs Agricultural Experiment Station. Part of the funding for this survey was provided by the Connecticut Department of Environmental Protection. The survey is part of the technical assistance furnished to the Windham County Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: These dairy farms are on adjoining areas of the Hinckley-Merrimac and Woodbridge-Paxton-Ridgebury soil associations. (Photo courtesy of Virginia Welch, Danbury, Connecticut.)

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soil series

Issued December 1981

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foreword

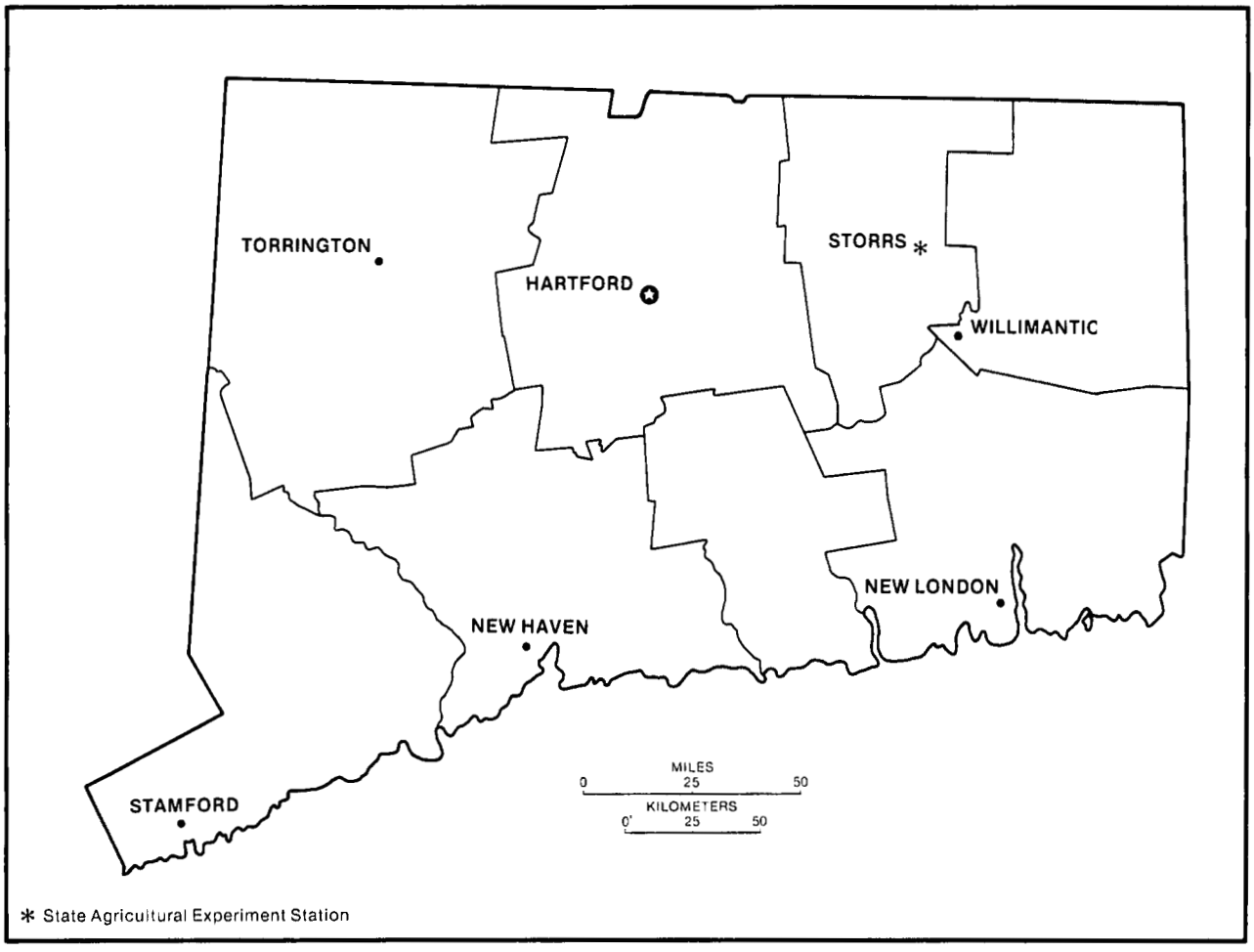
This soil survey contains information that can be used in land-planning programs in Windham County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

Jack C. Davis
State Conservationist
Soil Conservation Service



Location of Windham County in Connecticut.

soil survey of
Windham County, Connecticut

By Alfred Roberts, Soil Conservation Service

Fieldwork by Ralph S. Baker, Robin A. Cochran, Marc H. Crouch, Dennis E. Hutchinson, Lewis W. Ilgen, Dean D. Rector, and Alfred Roberts, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service in cooperation with the Connecticut Agricultural Experiment Station and the Storrs Agricultural Experiment Station

WINDHAM COUNTY is in the northeastern part of Connecticut. The county is made up of 15 towns covering 330,240 acres, or 516 square miles. The elevation of the county ranges from 100 feet above sea level along the Quinebaug River in the towns of Canterbury and Plainfield to 1,202 feet above sea level on Snow Hill. The major rivers in the county are the Quinebaug in the eastern part of the county, the Natchaug in the western part, and the Willimantic and Shetucket in the southwestern part. The population centers in the county are Danielson, Plainfield, Putnam, and Willimantic. Windham County is mostly rural, and farming is a major enterprise. Farms cover about 35,000 acres in the county. The types of farming mainly are dairying, poultry and egg production, orchards, vegetable production, and a few vineyards.

This soil survey is an updated version of a soil survey of Windham County published in 1911. It has maps that show the soils in greater detail than do the maps in the earlier publication.

general nature of the survey area

This section describes the origins of Windham County and provides information about the industry, transportation facilities, and climate of the county.

development, industry, and transportation

The first settlement in the area of Windham County was established in 1686, and the county was officially established in May 1726. Most of the urban development in the county has been in the towns of Killingly, Plainfield, Putnam, and Windham. Some of the major nonfarm industries in the county are textile milling and the manufacture of machinery, rubber and plastics, and fabricated metal products.

The major highways in the county are the Connecticut Turnpike, which runs from the southeastern part of the county to Rhode Island, and Connecticut Route 52, a connecting route between Massachusetts and the Connecticut Turnpike. The county has several small airports, and rail service is available in the eastern part of the county and in Willimantic.

climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Mansfield, Connecticut, in the period 1953 to 1974. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 26 degrees F, and the average daily minimum temperature is 16 degrees. The lowest temperature on record, which

occurred at Mansfield on January 22, 1961, is -27 degrees. In summer the average temperature is 68 degrees, and the average daily maximum temperature is 81 degrees. The highest recorded temperature, which occurred at Mansfield on September 2, 1953, is 100 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 43 inches. Of this, 22 inches, or 51 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 17 inches. The heaviest 1-day rainfall during the period of record was 5.05 inches at Mansfield on August 19, 1955. Thunderstorms occur on about 22 days each year, and most occur in summer.

Average seasonal snowfall is 42 inches. The greatest snow depth at any one time during the period of record was 24 inches. On an average of 37 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is less than 50 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 60 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 11 miles per hour, in April.

how this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to nationwide uniform procedures. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under "General soil map units" and "Detailed soil map units."

While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. All soils are field tested to determine their characteristics. Interpretations of those characteristics may be modified during the survey. Data are assembled from other sources, such as test results, records, field experience, and state and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, woodland managers, engineers, planners, developers and builders, home buyers, and others.

general soil map units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in others but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one unit differ from place to place in slope, depth, stoniness, drainage, and other characteristics that affect management.

soil descriptions

1. Brookfield-Brimfield

Gently sloping to steep, well drained and somewhat excessively drained, loamy soils on glacial till uplands

This unit makes up about 1 percent of the survey area. The unit is about 40 percent Brookfield soils, 20 percent Brimfield soils, and 40 percent soils of minor extent.

This unit consists of rolling hills and ridges that have short, choppy slopes and rock outcrops. Slopes mostly range from 3 to 35 percent.

The Brookfield soils are well drained. They are mostly on hillsides and in areas between ridges. Typically, the surface layer of the soils is fine sandy loam, the subsoil is fine sandy loam and gravelly fine sandy loam, and the substratum is gravelly fine sandy loam.

The Brimfield soils are somewhat excessively drained and are less than 20 inches deep to bedrock. They are on the sides and tops of ridges and hills. Typically, the surface layer of the soils is fine sandy loam and the subsoil is gravelly fine sandy loam. The underlying bedrock is unweathered schist and gneiss.

The soils of minor extent mainly are well drained Canton and Charlton soils in areas between ridges; excessively drained Hollis soils on ridges and side slopes of hills; poorly drained Ridgebury and Leicester soils and very poorly drained Whitman soils in narrow drainageways; and very poorly drained Adrian, Palms, and Carlisle soils in depressions.

This unit is mostly in woodland. A few small areas are used for homesites. The soils generally are too stony for farming, but a few areas are used for hay and pasture. The depth to bedrock in the Brimfield soils limits community development. The steep areas of the unit are generally better suited to trees or wildlife habitat than to most other uses.

2. Charlton-Hollis

Gently sloping to steep, well drained and somewhat excessively drained, loamy soils on glacial till uplands

This map unit makes up about 15 percent of the survey area. The unit is about 35 percent Charlton soils, 20 percent Hollis soils, and 45 percent soils of minor extent.

This unit consists of long, narrow ridges that have steep side slopes and of broad, gently sloping to steep hills that extend mainly in a north-south direction. Slopes range from 3 to 35 percent.

The Charlton soils are well drained. They are mostly on hillsides and between the ridges. Typically, the surface layer of the soils is fine sandy loam, the subsoil is fine sandy loam and sandy loam, and the substratum is sandy loam.

The Hollis soils are somewhat excessively drained and are less than 20 inches deep to bedrock. They are mostly on steep side slopes and the tops of ridges and hills. Typically, the surface layer of the soils is fine sandy loam and the subsoil is gravelly fine sandy loam. The underlying bedrock is hard, unweathered schist or gneiss.

The soils of minor extent mainly are excessively drained Gloucester soils and well drained Brookfield and Canton soils on hillsides between ridges; well drained Paxton soils and moderately well drained Woodbridge soils on small rounded hills; moderately well drained Sutton soils on concave slopes and in slight depressions; poorly drained Ridgebury and Leicester soils and very poorly drained Whitman soils in drainageways; very poorly drained Adrian, Palms, and Carlisle soils in depressions; and areas of exposed bedrock.

Most areas of this unit are in woodland. A few areas are used for farming or community development. The depth to bedrock of the Hollis soils is the main limitation of the unit for community development. Most areas, particularly the steeper areas, are better suited to trees and wildlife habitat than to most other uses.

3. Charlton-Canton-Leicester

Nearly level to steep, well drained and poorly drained, loamy soils on broad ridges and hillsides of glacial till uplands

This map unit makes up about 32 percent of the survey area. The unit is about 25 percent Charlton soils, 20 percent Canton soils, 10 percent Leicester soils, and 45 percent soils of minor extent (fig. 1).

The unit consists of broad, steep ridges and hills that extend mostly in a north-south direction. Slopes range from 3 to 35 percent.

The Charlton soils are well drained. They are mostly on broad hills and ridges. Typically, the surface layer of the soils is fine sandy loam, the subsoil is fine sandy loam and sandy loam, and the substratum is sandy loam.

The Canton soils are well drained. They are mostly on broad hills and ridges. Typically, the surface layer of the soils is fine sandy loam, the subsoil is fine sandy loam, gravelly fine sandy loam, and gravelly sandy loam, and the substratum is gravelly loamy sand.

The Leicester soils are poorly drained. They are in narrow drainageways and small depressions. Typically, the surface layer of the soils is fine sandy loam, the subsoil is fine sandy loam, and the substratum is sandy loam.

The soils of minor extent mainly are excessively drained Gloucester soils and somewhat excessively drained Hollis soils on steep side slopes of hills, well drained Paxton soils and moderately well drained Woodbridge soils on rounded hills, moderately well drained Sutton soils on concave slopes and in slight depressions, poorly drained Ridgebury soils and very poorly drained Whitman soils along narrow drainageways, and very poorly drained Adrian, Palms, and Carlisle soils in depressions.

Most areas of this unit are in woodland. Some areas, mainly the gently sloping to moderately steep areas that have been cleared of stones, are used for farming or community development. A seasonal high water table in some areas is the major limitation. The steep areas of the unit are better suited to trees and wildlife habitat than to most other uses.

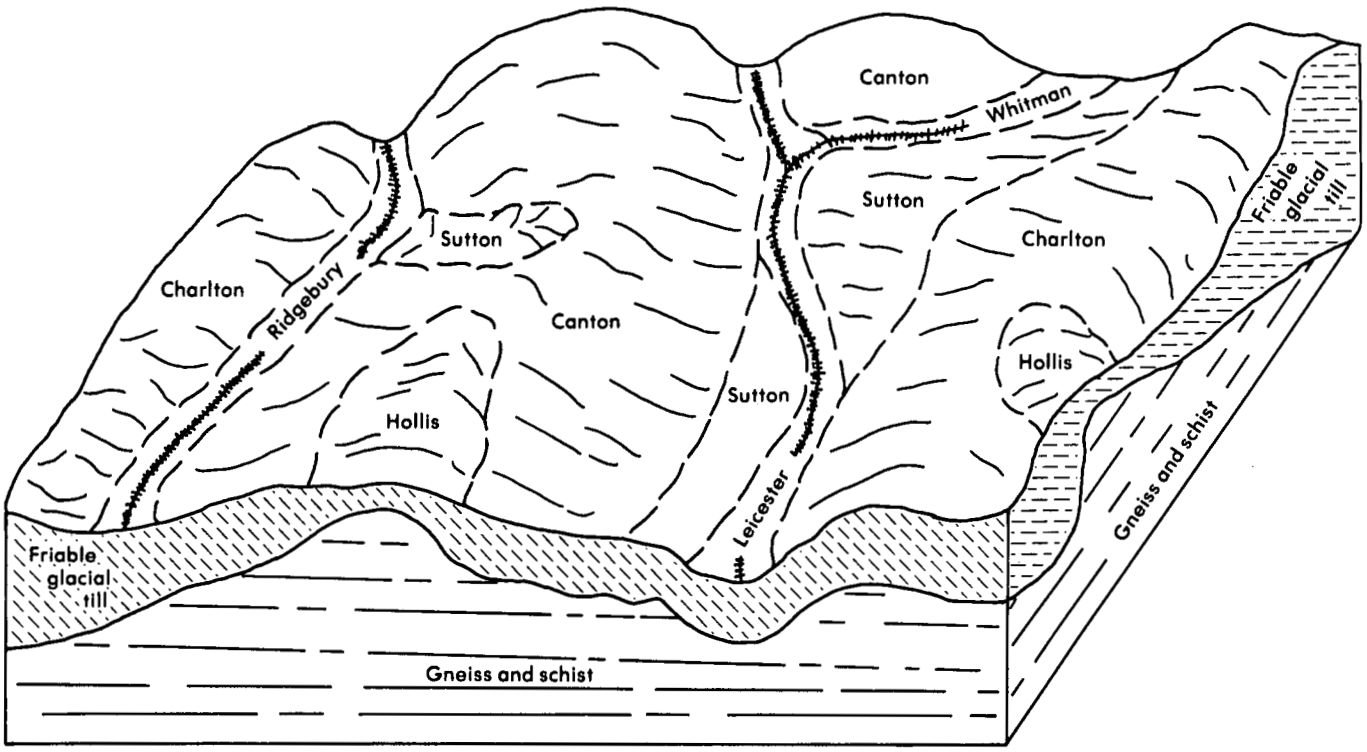


Figure 1.—Typical pattern of soils and underlying material in the Charlton-Canton-Leicester association.

4. Woodbridge-Paxton-Ridgebury

Nearly level to steep, well drained to poorly drained, loamy soils that have a compact substratum; on drumloidal glacial till uplands

This map unit makes up about 28 percent of the survey area. The unit is about 50 percent Woodbridge soils, 25 percent Paxton soils, 15 percent Ridgebury soils, and 10 percent soils of minor extent (fig. 2).

The unit consists of rounded, oval hills that extend mostly in a north-south direction. Slopes range from 3 to 25 percent.

The Woodbridge soils are moderately well drained. They are on the tops of broad hills and on concave slopes at the base of hills. Typically, the surface layer of the soils is fine sandy loam, the subsoil is fine sandy loam, and the substratum is fine sandy loam and gravelly fine sandy loam.

The Paxton soils are well drained. They are on the tops and side slopes of hills. Typically, the surface layer, the subsoil, and the substratum are fine sandy loam.

The Ridgebury soils are poorly drained. They are in depressions and along narrow drainageways. Typically, the surface layer of the soils is fine sandy loam, the subsoil is fine sandy loam, and the substratum is sandy loam and fine sandy loam.

The soils of minor extent mainly are well drained Canton and Charlton soils on broad hills and ridges; excessively drained Hollis soils on steep hillsides and ridges; moderately well drained Sutton soils in slight depressions; poorly drained Leicester soils and very poorly drained Whitman soils along drainageways; and very poorly drained Adrian, Palms, and Carlisle soils in depressions.

Most areas of this unit are suited to and used for farming. The steep and stony areas are mostly woodland, but a few areas are in community development. Slow water movement through the soils and a seasonal high water table are the main limitations for community development.

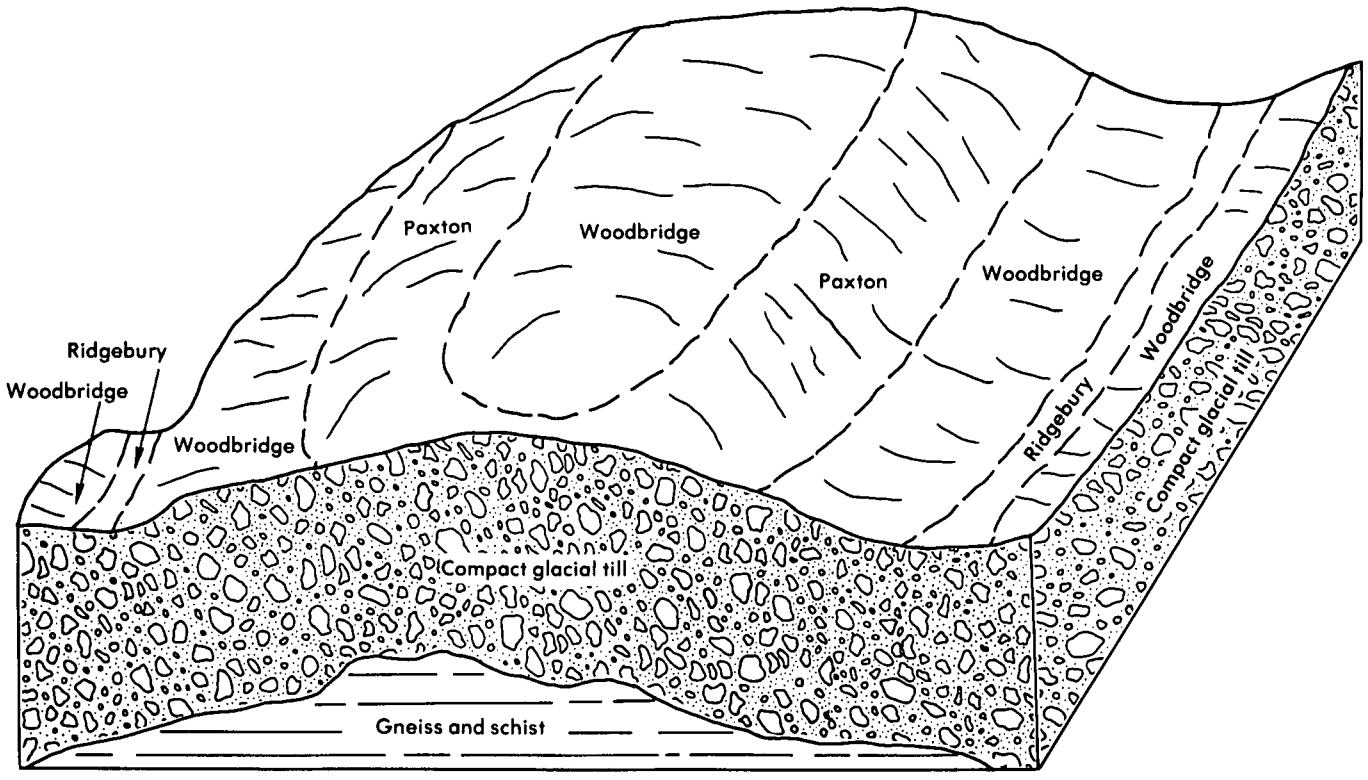


Figure 2.—Typical pattern of soils and underlying material in the Woodbridge-Paxton-Ridgebury association.

5. Hinckley-Merrimac

Nearly level to very steep, excessively drained and somewhat excessively drained, sandy soils on glacial outwash plains and terraces

This map unit makes up about 20 percent of the survey area. The unit is about 45 percent Hinckley soils, 10 percent Merrimac soils, and 45 percent soils of minor extent (fig. 3).

The unit consists of outwash plains and stream terraces that are throughout the survey area. Slopes range from 3 to 40 percent.

The Hinckley soils are excessively drained and are mostly on stream terraces. Typically, the surface layer of the soils is gravelly sandy loam, the subsoil is gravelly sandy loam and gravelly loamy sand, and the substratum is gravelly sand.

The Merrimac soils are somewhat excessively drained and are on stream terraces and outwash plains. Typically, the surface layer of the soils is sandy loam, the subsoil is sandy loam and loamy sand, and the substratum is gravelly sand and stratified sand and gravel.

The soils of minor extent mainly are excessively drained Gloucester soils on hills; well drained Agawam soils on terraces and Canton and Charlton soils on the tops and side slopes of hills; excessively drained Windsor soils on outwash plains; well drained Occum soils and moderately well drained Pootatuck soils, poorly drained Rippowam soils, and very poorly drained Saco soils on flood plains; moderately well drained Ninigret soils and poorly drained Walpole soils in depressions; and very poorly drained Adrian, Palms, and Carlisle soils in low depressions.

Most areas of this unit are suited to and used for farming. Some areas are in community development, and a few are in woodland.

6. Saco-Rippowam-Pootatuck

Nearly level, moderately well drained to very poorly drained, loamy soils on flood plains

This map unit makes up about 4 percent of the survey area. The unit is about 35 percent Saco soils, 25 percent Rippowam soils, 15 percent Pootatuck soils, and 25 percent soils of minor extent.

The unit consists of flood plains along the major streams and their tributaries throughout the survey area. Slopes range from 0 to 3 percent.

The Saco soils are very poorly drained and are in low depressional areas of flood plains. Typically, the surface layer of the soils is silt loam and the substratum is silt loam and stratified sand and gravel.

The Rippowam soils are poorly drained and are at a slightly higher part of the flood plain than the Saco soils. Typically, the surface layer of the Rippowam soils is fine sandy loam, the subsoil is fine sandy loam and sandy loam, and the substratum is gravelly sand.

The Pootatuck soils are moderately well drained and are at the highest part of the flood plain. Typically, the surface layer of the soils is fine sandy loam, the subsoil is fine sandy loam and sandy loam, and the substratum is sand.

The soils of minor extent mainly are excessively drained Suncook soils and well drained Occum soils on high parts of the flood plain; excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Ninigret soils on adjacent terraces; and poorly drained Scarboro and Walpole soils in low depressions on adjacent stream terraces.

Most areas of this map unit are woodland. A few areas are farmed. The main limitation for most uses is frequent flooding.

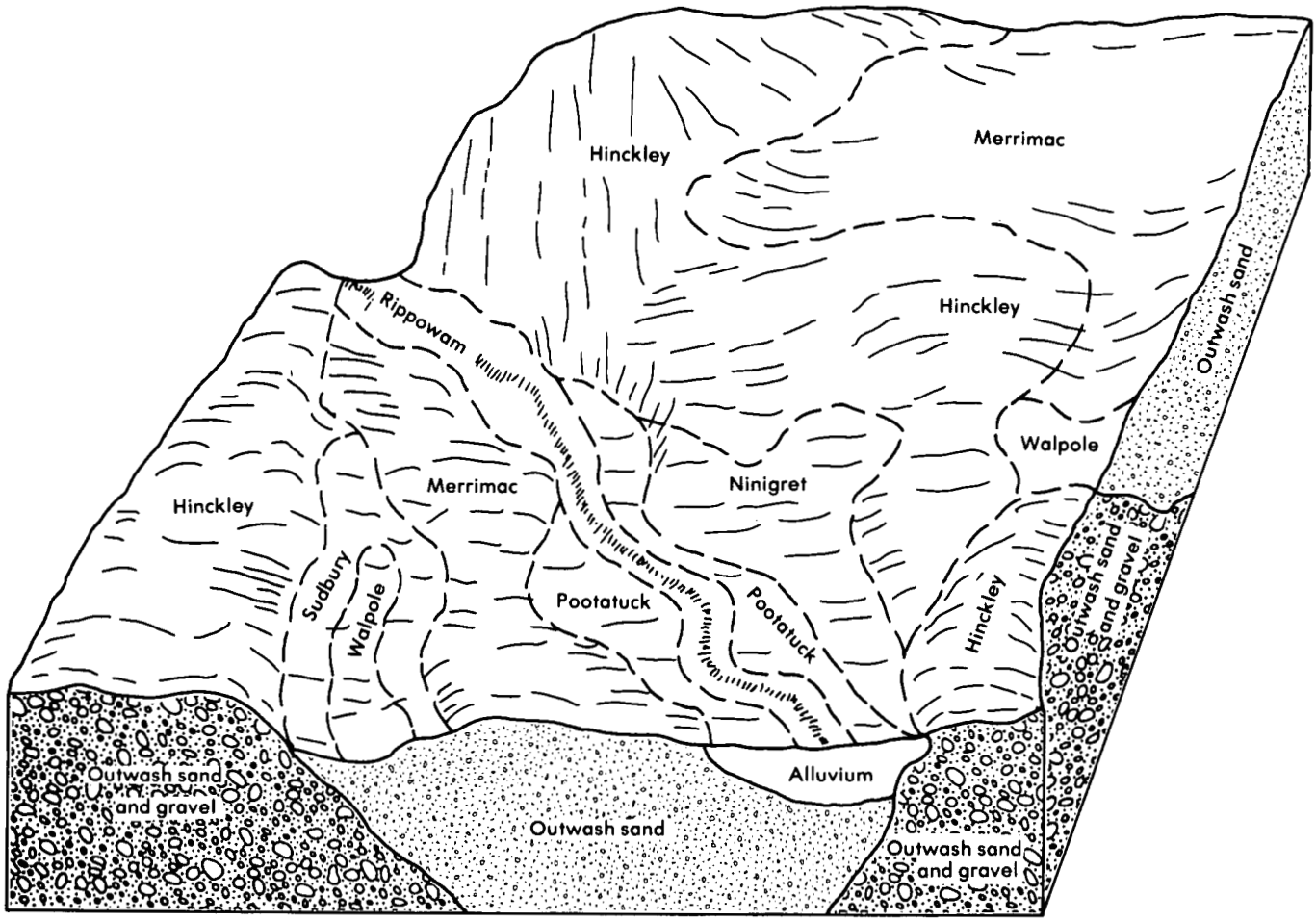


Figure 3.—Typical pattern of soils and underlying material in the Hinckley-Merrimac association.

detailed soil map units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and management of the soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, *Woodbridge fine sandy loam, 0 to 3 percent slopes*, is one of several phases in the *Woodbridge* series.

Some map units are made up of two or more major soils. These map units are called soil complexes and undifferentiated groups.

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. *Charlton-Hollis fine sandy loams, very rocky, 3 to 15 percent slopes*, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. *Canton and Charlton fine sandy loams, 3 to 8 percent slopes*, is an undifferentiated group in this survey area.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. *Pits, gravel*, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

soil descriptions

Aa—Adrian and Palms mucks. This unit consists of nearly level, very poorly drained organic soils in depressions and along streams of outwash plains and glacial till uplands. The areas are mostly oval or long and narrow and range from 5 to 40 acres. Slopes range from 0 to 2 percent but are mostly less than 1 percent. About 45 percent of the total acreage of this unit is Adrian soils, 35 percent is Palms soils, and 20 percent is other soils. Some areas of the unit consist almost entirely of Adrian soils, some almost entirely of Palms soils, and some of both. The Adrian and Palms soils were mapped together because there are no significant differences in their use and management.

Typically, the Adrian soils have a surface layer of black and very dark gray muck 12 inches thick. The subsurface layer is black muck 21 inches thick. The substratum is gray gravelly sand to a depth of 60 inches or more.

Typically, the Palms soils have a surface layer of black muck 9 inches thick. The subsurface layer is very dark brown and black muck 21 inches thick. The substratum is gray and grayish brown silt loam and fine sandy loam to a depth of 60 inches or more.

Included with this unit in mapping are small areas of very poorly drained Carlisle, Saco, Scarboro, and Whitman soils. A few small areas have a thin, loamy surface layer.

These Adrian and Palms soils are wet most of the year. Water is on the surface for several weeks from fall through spring and after heavy summer rains. The soils have a high available water capacity. The Adrian soils have moderately rapid permeability in the organic layers and rapid permeability in the substratum. The Palms soils have moderately rapid permeability in the organic layers and moderate or moderately slow permeability in the substratum. Runoff is very slow on both soils. Both soils are strongly acid to medium acid in the organic layers and medium acid to slightly acid in the substratum.

The soils in this unit are used mainly as woodland, or they are in marshgrasses and sedges. A few cleared areas have been drained and are used for pasture.

Wetness makes the soils of this unit generally unsuitable for cultivated crops. Most areas are difficult to drain, and subsidence is a hazard in areas that are drained.

Wetness also makes the soils poorly suited to trees. It severely limits the use of equipment and causes a high rate of seedling mortality. The high water table limits rooting, causing a hazard of uprooting during windy periods.

Wetness and low strength in the organic layers limit these soils for community development, especially for onsite septic systems.

The capability subclass is VIw.

AfA—Agawam fine sandy loam, 0 to 3 percent slopes. This soil is nearly level and well drained. It is on outwash plains and stream terraces. Areas of this soil are irregular in shape or long and narrow and mostly range from 4 to 20 acres.

Typically, the surface layer is dark grayish brown fine sandy loam 10 inches thick. The subsoil is yellowish brown and strong brown fine sandy loam 20 inches thick. The substratum is very pale brown fine sand and sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley and Windsor soils, somewhat excessively drained Merrimac soils, well drained Occum soils, moderately well drained Ninigret soils, and poorly drained Walpole soils. Included areas make up about 10 percent of the unit.

The water table in the Agawam soil is commonly below a depth of 6 feet. The available water capacity is moderate. This soil has moderately rapid permeability in the surface layer and upper part of the subsoil, moderately rapid or rapid permeability in the lower part of the subsoil, and rapid permeability in the substratum. Runoff is slow. The soil is strongly acid to slightly acid.

This soil is used mainly as cropland. In a few areas it is used as woodland or for community development.

This soil is well suited to cultivated crops and to trees. Tilth is easy to maintain in cultivated areas, and the hazard of erosion is slight. The use of cover crops and minimum tillage are the common crop management practices.

The rapid permeability in the lower part of the soil causes a hazard of ground-water pollution in areas used for onsite septic systems. Some excavations in this soil are unstable.

The capability class is I.

AfB—Agawam fine sandy loam, 3 to 8 percent slopes. This soil is gently sloping and well drained. It is on outwash plains and stream terraces. Areas of this soil are long and narrow or irregular in shape and mostly range from 4 to 10 acres. Slopes are smooth and convex.

Typically, the surface layer is dark grayish brown fine sandy loam 10 inches thick. The subsoil is yellowish brown and strong brown fine sandy loam 20 inches thick. The substratum is very pale brown fine sand and sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley and Windsor soils, somewhat excessively drained Merrimac soils, well drained Occum soils, and moderately well drained Ninigret soils. A few large areas have slopes of more than 8 percent. Included areas make up about 10 percent of the unit.

The water table in this Agawam soil is commonly below a depth of 6 feet. The available water capacity is moderate. The permeability of the soil is moderately rapid in the surface layer and upper part of the subsoil, moderately rapid or rapid in the lower part of the subsoil, and rapid in the substratum. Runoff is medium. The soil is strongly acid to slightly acid.

This soil is used mainly as cropland. A few areas are woodland, and some others are in community development.

This soil is well suited to cultivated crops and to trees. Tilth is easy to maintain in cultivated areas. The use of cover crops and minimum tillage are farming management practices that help to control a moderate erosion hazard.

The rapid permeability in the lower part of the soil causes a hazard of ground-water pollution in areas used for onsite septic systems. Some excavations in this soil are unstable.

The capability subclass is IIe.

BkC—Brookfield-Brimfield fine sandy loams, very rocky, 3 to 15 percent slopes. This unit consists of gently sloping to sloping, somewhat excessively drained and well drained soils on ridges and glacial till plains mostly in the town of Woodstock. The areas of this unit are mostly irregular in shape and range from 5 to 200 acres. Slopes are mainly 100 to 200 feet long. This unit is about 45 percent Brookfield soils, 25 percent Brimfield soils, 20 percent other soils, and 10 percent exposed bedrock. Stones and boulders cover 1 to 8 percent of

the surface, which is marked by a few narrow, intermittent drainageways and small, wet depressions. The Brookfield and Brimfield soils are so intermingled that it was not practical to map them separately.

Typically, the Brookfield soils have a surface layer of dark brown fine sandy loam 1 inch thick. The subsoil is dark reddish brown, yellowish red, and strong brown fine sandy loam and gravelly fine sandy loam 28 inches thick. The substratum is yellowish brown gravelly fine sandy loam to a depth of 60 inches or more.

Typically, the Brimfield soils have a surface layer of dark brown fine sandy loam 1 inch thick. The subsoil is reddish brown and yellowish red gravelly fine sandy loam 17 inches thick. Hard unweathered schist bedrock is at a depth of 18 inches.

Included with this unit in mapping are small areas of well drained Canton, Charlton, and Paxton soils; moderately well drained Sutton and Woodbridge soils; and poorly drained Leicester soils. Also included are many small areas where bedrock is 20 to 40 inches from the surface and a few areas where the stones and boulders have been cleared.

The water table in this unit is commonly below a depth of 6 feet. The available water capacity is moderate in the Brookfield soils and low in the Brimfield soils. The permeability of both soils is moderate to moderately rapid. Runoff is medium to rapid. The soils are very strongly acid to medium acid.

Most areas of this unit are woodland. The soils in a few areas are used for pasture or community development.

This unit generally is too stony for cultivation. The depth to bedrock in the Brimfield soils, the exposed bedrock, and the stones on the surface limit the use of farming equipment. The erosion hazard is moderate to severe.

The soils in this unit are fairly suited to use as woodland. Productivity is moderate on the Brookfield soils and low on the Brimfield soils. The Brimfield soils are droughty and have a high rate of seedling mortality. The depth to bedrock in the Brimfield soils limits rooting and causes a hazard of uprooting during windy periods.

The areas of exposed bedrock outcrops and the depth to bedrock in the Brimfield soils are the main limitations for community development, especially for onsite septic systems and building sites. The stones and boulders on the surface limit landscaping.

The capability subclass is VIs.

BkD—Brookfield-Brimfield fine sandy loams, very rocky, 15 to 35 percent slopes. This complex consists of moderately steep to steep, somewhat excessively drained and well drained soils on ridges and glacial till uplands mostly in the town of Woodstock. The areas of this unit are mostly long and narrow or oval and range from 5 to 100 acres. Slopes are mainly convex and 100 to 500 feet long. The unit is about 45 percent Brookfield soils, 25 percent Brimfield soils, 20 percent other soils, and 10 percent exposed bedrock. Stones and boulders cover 1 to 8 percent of the surface, which is marked by a few intermittent drainageways. The Brookfield and Brimfield soils are so intermingled that it was not practical to map them separately.

Typically, the Brookfield soils have a surface layer of dark brown fine sandy loam 1 inch thick. The subsoil is dark reddish brown, yellowish red, and strong brown fine sandy loam and gravelly fine sandy loam 28 inches thick. The substratum is yellowish brown gravelly fine sandy loam to a depth of 60 inches or more.

Typically, the Brimfield soils have a surface layer of dark brown fine sandy loam 1 inch thick. The subsoil is reddish brown and yellowish red gravelly fine sandy loam 17 inches thick. Hard unweathered schist bedrock is at a depth of 18 inches.

Included with this unit in mapping are small areas of well drained Canton, Charlton, and Paxton soils and moderately well drained Sutton and Woodbridge soils. Also included are small areas of soils with bedrock at a depth of 20 to 40 inches. A few areas have been cleared of stones and boulders.

The water table in this unit is commonly below a depth of 6 feet. The available water capacity is moderate in the Brookfield soils and low in the Brimfield soils. Both soils have moderate to moderately rapid permeability. Runoff is rapid. The soils are very strongly acid to medium acid.

Most areas of this complex are woodland. The soils in a few areas are used for pasture or as homesites.

The soils in this complex are too steep and stony for cultivation. They are fairly suited to trees. The slopes, stones, and exposed rock hinder the use of some types of equipment. The Brookfield soils have fair productivity for trees, and the Brimfield soils have poor productivity. The Brimfield soils are droughty and have a high rate of seedling mortality. The depth to bedrock in the Brimfield soils limits rooting and causes a hazard of uprooting during windy periods.

Slope, exposed bedrock outcrops, and the depth to bedrock limit these soils for community development, especially for onsite septic systems and building sites. The stones and slopes limit landscaping.

The capability subclass is VIIs.

CbB—Canton and Charlton fine sandy loams, 3 to 8 percent slopes. This unit consists of gently sloping, well drained soils on ridges, hills, and side slopes of glacial till uplands. The areas are mostly rectangular or irregular in shape and mainly range from 3 to 30 acres. Slopes are generally smooth and convex and 200 to 400 feet long. About 45 percent of the total acreage of this unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas of this unit consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The

subsoil is yellowish brown fine sandy loam, gravelly fine sandy loam, and gravelly sandy loam 21 inches thick. The substratum is pale brown gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils, well drained Paxton soils, and moderately well drained Sutton soils. Also included are a few large, nearly level areas and a few areas that have a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is moderate or moderately rapid. Both soils have medium to rapid runoff, have moderate available water capacity, and both are very strongly acid to medium acid.

Most areas of this unit are used for crops, mainly corn for silage, hay, vegetables, and pasture (fig. 4). Some areas are in community development or are used for recreation.

The soils of this unit are well suited to cultivated crops. Tilth is easy to maintain. The use of cover crops and minimum tillage are farming management practices that help to control a moderate erosion hazard.

The soils are well suited to use as woodland, but productivity is higher on the Charlton soils than on the Canton soils.

Instability of some excavations in the Canton soils is the main limitation of the unit for community development.

The capability subclass is IIe.

Figure 4.—Corn on an area of Canton and Charlton fine sandy loams, 3 to 8 percent slopes.

CbC—Canton and Charlton fine sandy loams, 8 to 15 percent slopes. This unit consists of sloping, well drained soils on ridges, hills, and side slopes of glacial till uplands. The areas are mostly rectangular or oval and range from 3 to 20 acres. Slopes are mainly smooth and convex and less than 200 feet long. About 45 percent of the total acreage of the unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas of this unit consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown fine sandy loam, gravelly fine sandy loam, and gravelly sandy loam 21 inches thick. The substratum is pale brown gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils, well drained Paxton soils, and moderately well drained Sutton soils. Also included are a few large areas with slopes of more than 15 percent and a few areas with a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is moderate or moderately rapid. Both soils have moderate available water capacity and medium to rapid runoff, and both are very strongly acid to medium acid.

The soils in most areas of this unit are in crops, mainly corn for silage, vegetables, hay, and pasture. In a few areas the soils are in community development or are used for recreation.

The soils of this unit are well suited to cultivated crops and easy to maintain in good tilth, but the erosion hazard is severe. Minimum tillage, the use of cover crops, stripcropping, and using diversions and waterways help to control erosion in cultivated areas.

These soils are well suited to use as woodland, but productivity is higher on the Charlton soils than on the Canton soils.

Slope is the main limitation of this unit for community development, especially for onsite septic systems. Excavations in these soils are unstable.

The capability subclass is IIIe.

CcB—Canton and Charlton very stony fine sandy loams, 3 to 8 percent slopes. This unit consists of gently sloping, well drained soils on ridges, hills, and side slopes of glacial till uplands. The areas are mostly long and narrow or oval and range from 5 to 50 acres. Slopes are mainly smooth and convex and are 200 to 400 feet long. Stones cover 1 to 8 percent of the surface. About 45 percent of the total acreage of this unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas of this unit consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown fine sandy loam, gravelly fine sandy loam, and gravelly sandy loam 21 inches thick. The substratum is pale brown gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils, well drained Paxton soils, and moderately well drained Sutton soils. Also included are a few large, nearly level areas and a few areas that have a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is moderate or moderately rapid. Both soils have moderate available water capacity and medium runoff, and both are very strongly acid to medium acid.

Most areas of this unit are woodland. The soils in a few areas are used for pasture or hay. In some areas they are in community development or are used for recreation.

The soils of this unit generally are too stony for cultivation. Stone removal makes the soils well suited to cultivated crops but is difficult. The soils are well suited to use as woodland, but the Charlton soils have higher productivity than the Canton soils.

Some excavations in the Canton soils are unstable. The stones on the surface limit landscaping.

The capability subclass is VIs.

CcC—Canton and Charlton very stony fine sandy loams, 8 to 15 percent slopes. This unit consists of sloping, well drained soils on ridges, hills, and side slopes of glacial till uplands. The areas are mostly long and narrow and range from 3 to 20 acres. Slopes are mainly smooth and convex and less than 200 feet long. Stones cover 1 to 8 percent of the surface. About 45

percent of the total acreage of this unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas of this unit consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam about 2 inches thick. The subsoil is yellowish brown fine sandy loam, gravelly fine sandy loam, and gravelly sandy loam 21 inches thick. The substratum is pale brown gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils, well drained Paxton soils, and moderately well drained Sutton soils. A few areas have a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is moderate or moderately rapid. Both soils have moderate available water capacity and rapid runoff, and both are very strongly acid to medium acid.

Most areas of this unit are in woodland. A few areas are used for pasture and hay. Some areas are in community development.

The soils of this unit are too stony for cultivation. Stone removal makes the soils suited to cultivated crops but is difficult. The soils are well suited to woodland, but the Charlton soils have higher productivity than the Canton soils.

Slope is the main limitation of the soils for community development, especially for onsite septic systems. Slopes of excavations are unstable. The stones on the surface limit landscaping.

The capability subclass is VIs.

CdC—Canton and Charlton extremely stony fine sandy loams, 3 to 15 percent slopes. This unit consists of gently sloping to sloping, well drained soils on ridges, hills, and side slopes of glacial till uplands. The areas are oval or irregular in shape and range from 5 to 100 acres. Slopes are mostly smooth and convex and are 100 to 600 feet long. Stones cover 8 to 25 percent of the surface. About 45 percent of the total acreage of this unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas of this unit consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown fine sandy loam, gravelly fine sandy loam, and gravelly sandy loam 21 inches thick. The substratum is pale brown gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils, well drained Paxton soils, and moderately well drained Sutton soils. Also included are a few nearly level areas and a few areas that have a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is moderate or moderately rapid. Both soils have moderate available water capacity and medium to rapid runoff, and both are very strongly acid to medium acid.

Most areas of this unit are in woodland. A few areas are used for pasture, and a few others are in community development.

The soils of this unit generally are too stony for cultivation (fig. 5). Stone removal makes the soils suited to cultivation but is difficult. The soils are well suited to woodland, but the Charlton soils have higher productivity than the Canton soils. The stones on the surface hinder the use of some woodland harvesting equipment.

Slope is the main limitation of the soils for community development, especially for onsite septic systems. Slopes of excavations in these soils are unstable. The stones on the surface hinder landscaping.

The capability subclass is VIIs.

CdD—Canton and Charlton extremely stony fine sandy loams, 15 to 35 percent slopes. This unit consists of moderately steep to steep, well drained soils on ridges, hills, and side slopes of glacial till uplands. The areas are mostly long and narrow and range from 5 to 30 acres. Slopes are smooth and convex and are mainly less than 200 feet long. Stones cover 8 to 25 percent of the surface. About 45 percent of the total acreage of this unit is Canton soils, 40 percent is Charlton soils, and 15 percent is other soils. Some areas consist almost entirely of Canton soils, some almost entirely of Charlton soils, and some of both. The soils were mapped together because they have no significant differences in use and management.

Typically, the Canton soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The

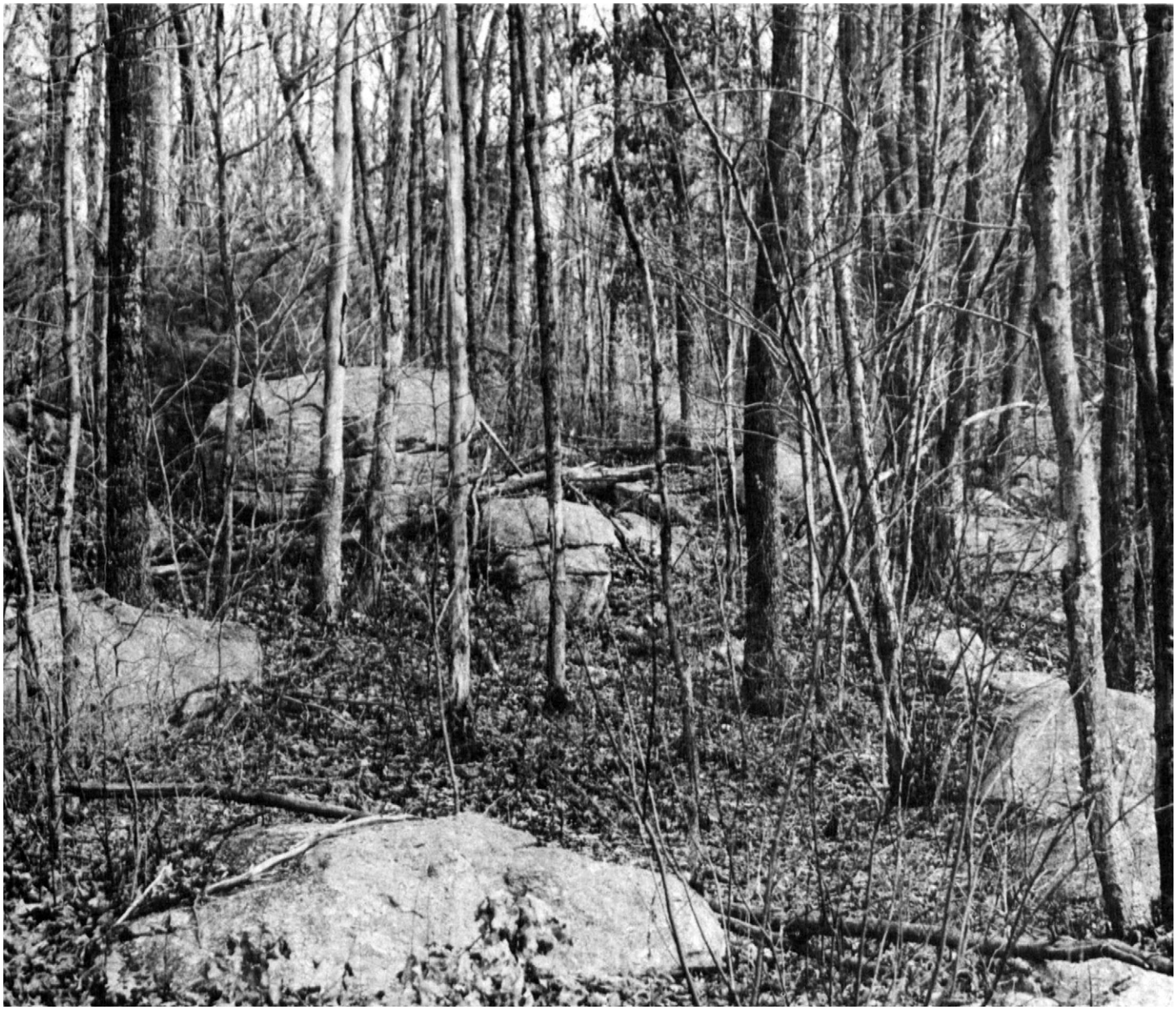


Figure 5.—An area of Canton and Charlton extremely stony fine sandy loams, 3 to 15 percent slopes.

subsoil is yellowish brown fine sandy loam, gravelly fine sandy loam, and gravelly sandy loam 21 inches thick. The substratum is pale brown gravelly loamy sand to a depth of 60 inches or more.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches.

Included with these soils in mapping are small areas of somewhat excessively drained Gloucester and Hollis soils and well drained Paxton soils. Also included are a few large areas where stones cover less than 8 percent of the surface and areas with a compact substratum at a depth of 40 to 50 inches.

The water table in these Canton and Charlton soils is commonly at a depth of more than 6 feet. The permeability of the Canton soils is moderately rapid in the surface layer and subsoil and rapid in the substratum. The permeability of the Charlton soils is

moderate or moderately rapid. Both soils have moderate available water capacity and rapid runoff, and both are very strongly acid to medium acid.

Most areas of this unit are in woodland. A few small areas are used for pasture.

The stones on the surface and slope make the soils of this unit generally unsuitable for cultivation. The soils are fairly suited to woodland; the Charlton soils have higher productivity than the Canton soils. Slope and the stones hinder the use of some woodland harvesting equipment.

Slope limits the soils of this unit for community development, especially for onsite septic systems. Slopes of excavations in the soils are unstable, and the stones on the surface hinder landscaping.

The capability subclass is VIIs.

Ce—Carlisle muck. This soil is nearly level and very poorly drained. It is in low depressions on outwash terraces and glacial till plains. Areas of this soil are mostly oval and range from 5 to 200 acres. Slopes range from 0 to 2 percent but are mostly less than 1 percent.

Typically, this soil is black, very dark brown, and dark reddish brown muck to a depth of 60 inches or more.

Included with this soil in mapping are small areas of very poorly drained Adrian, Palms, Saco, Scarboro, and Whitman soils. A few small areas have a thin mineral layer on the surface. Included areas make up about 25 percent of the unit.

The water table of this Carlisle soil is at or near the surface during most of the year. The available water capacity is high. Permeability is moderately rapid. Runoff is very slow, and water is on the surface of some areas from autumn to spring and after heavy rains. The soil is very strongly acid to slightly acid.

Most areas of this soil are wooded or are covered by marshgrasses and sedges. A few areas have been cleared.

The high water table makes this soil generally unsuitable for cultivated crops. Most areas do not have adequate drainage outlets. Although most areas support red maple, ash, and alder, the soil is poorly suited to woodland production. The organic material will not support heavy equipment, and uprooting is common during windy periods.

The high water table and the low strength of the organic material make this soil generally unsuitable for community development.

The capability subclass is VIw.

CrC—Charlton-Hollis fine sandy loams, very rocky, 3 to 15 percent slopes. This unit consists of gently sloping to sloping, somewhat excessively drained and well drained soils on hills and ridges of glacial till uplands. The areas of this unit are mostly irregular in shape and range from 5 to 200 acres. Slopes are mostly complex and 100 to 200 feet long. Stones cover 1 to 8 percent of the surface, which is marked by a few narrow, intermittent drainageways and small, wet depressions. This unit is about 55 percent Charlton soils, 20 percent Hollis soils, 15 percent other soils, and 10 percent exposed bedrock. The Charlton and Hollis soils are in such a complex pattern that it was not practical to map them separately.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Typically, the Hollis soils have a surface layer of dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown gravelly fine sandy loam 12 inches thick. Hard, unweathered schist bedrock is at a depth of 14 inches.

Included with this unit in mapping are small areas of somewhat excessively drained Brimfield soils; well drained Brookfield, Canton, and Paxton soils; moderately well drained Sutton and Woodbridge soils; and poorly drained Leicester soils. Also included are small areas with bedrock at a depth of 20 to 40 inches and a few large areas that have been cleared of stones.

The water table in this unit is commonly at a depth of more than 6 feet. The available water capacity is moderate in the Charlton soils and very low or low in the Hollis soils. Both soils have moderate or moderately rapid permeability and medium to rapid runoff. Both are very strongly acid to medium acid.

Most areas of this unit are in woodland. A few areas are used for pasture or community development.

The stones on the surface and areas of exposed rock hinder the use of farm equipment and make the soils generally unsuitable for cultivation. Some cleared areas are suitable for pasture and some for hay (fig. 6).

This unit is suited to woodland production. However, the Hollis soils are droughty, and seedling mortality is high. Uprooting during windy periods is common on the Hollis soils because of the shallow rooting depth.

The areas of exposed rock and the depth to bedrock in the Hollis soils limit this unit for community development, especially as a building site or as a site for onsite septic systems. The stones on the surface restrict landscaping.

The capability subclass is VIs.

CrD—Charlton-Hollis fine sandy loams, very rocky, 15 to 35 percent slopes. This unit consists of moderately steep to steep, somewhat excessively drained and well drained soils on hills and ridges of glacial till uplands. Areas of this unit are mostly long and narrow or oval and range from 5 to 100 acres. Slopes are mainly convex and 100 to 500 feet long. Stones and boulders cover 1 to 8 percent of the surface. This unit is about 55 percent Charlton soils, 20 percent Hollis soils, 15 percent other soils, and 10 percent exposed bedrock. The Charlton and Hollis soils are in such a complex pattern that it was not practical to map them separately.

Typically, the Charlton soils have a surface layer of

Figure 6.—Pasture on an area of Charlton-Hollis fine sandy loams, very rocky, 3 to 15 percent slopes.

dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Typically, the Hollis soils have a surface layer of dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown gravelly fine sandy loam 12 inches thick. Hard, unweathered schist bedrock is at a depth of 14 inches.

Included with this unit in mapping are small areas of somewhat excessively drained Brimfield soils; well drained Brookfield, Canton, and Paxton soils; and moderately well drained Sutton and Woodbridge soils. Also included are areas with bedrock at a depth of 20 to 40 inches and a few small areas with slopes of more than 35 percent.

The water table in this unit is commonly at a depth of more than 6 feet. The available water capacity is moderate in the Charlton soils and very low or low in the Hollis soils. Both soils have moderate to moderately rapid permeability and rapid runoff. Both are very strongly acid to medium acid.

Most areas of this unit are in woodland. A few areas are in pasture, and a few are used for community development.

The stones on the surface, the areas of exposed rock, and the slope limit the use of farming equipment and make the soils generally unsuitable for cultivation. Some cleared areas are suitable for pasture.

The soils are suited to use as woodland. However, the Hollis soils are droughty, and seedling mortality is high. Uprooting during windy periods is common on the Hollis soils because of the shallow depth to bedrock. The slope and the stones and exposed rock limit the use of timber harvesting equipment.

The slope, the exposed rock, and the depth to bedrock in the Hollis soils limit this unit for community development, especially as a site for onsite septic systems and buildings.

The capability subclass is VIIs.

GbB—Gloucester very stony sandy loam, 3 to 8 percent slopes. This soil is gently sloping and somewhat excessively drained. It is on ridges and hills of glacial till uplands. The areas are mostly long and narrow or oval and range from 5 to 50 acres. Stones and boulders cover 1 to 8 percent of the surface. Slopes are mostly smooth and convex and 200 to 400 feet long.

Typically, the surface layer is very dark grayish brown sandy loam 4 inches thick. The subsoil is dark yellowish brown and yellowish brown gravelly sandy loam and loamy sand 21 inches thick. The substratum is light olive brown and light brownish gray gravelly loamy coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley soils and well drained Canton, Charlton, and Paxton soils. Also included are a few nearly level areas and a few areas where stones cover less than 1 percent of the surface. Included areas make up about 10 percent of the unit.

The water table in this Gloucester soil is commonly below a depth of 6 feet. The available water capacity is low. Runoff is slow to medium. The soil has rapid permeability and is very strongly acid to medium acid.

Most areas of this soil are in woodland. A few areas are used for pasture, and a few are used for community development.

This soil generally is too stony and too droughty for cultivation. The soil is suited to woodland use, but droughtiness increases seedling mortality.

This soil is generally suited to community development, but the rapid permeability causes a hazard of ground-water pollution in some areas used for septic tanks. Some slopes of excavations in this soil are unstable.

The capability subclass is VIs.

GbC—Gloucester very stony sandy loam, 8 to 15 percent slopes. This soil is sloping and somewhat excessively drained. It is on ridges and hills of glacial till uplands. The areas are mostly long and narrow or oval and range from 15 to 40 acres. Stones and boulders cover 1 to 8 percent of the surface. Slopes are mainly smooth and convex and 200 to 400 feet long.

Typically, this soil has a surface layer of very dark grayish brown sandy loam 4 inches thick. The subsoil is dark yellowish brown and yellowish brown gravelly sandy loam and loamy sand 21 inches thick. The substratum is light olive brown and light brownish gray gravelly loamy coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley soils and well drained Canton, Charlton, and Paxton soils. Also included are a few areas where stones cover less than 1 percent of the surface. Included areas make up about 15 percent of the unit.

The water table in this Gloucester soil is commonly below a depth of 6 feet. The available water capacity is low. The permeability of this soil is rapid. Runoff is medium to rapid. The soil is very strongly acid to medium acid.

Most areas of this soil are in woodland. A few areas are in pasture, and a few are in community development.

This soil generally is too stony and too droughty for cultivation. The soil is suited to woodland, but droughtiness causes a high rate of seedling mortality.

This soil is generally suited to community development, but slope is a limitation for onsite septic systems and the rapid permeability causes a hazard of ground-water pollution in areas used for septic tanks. Some slopes of excavations in this soil are unstable. The stones on the surface hinder landscaping.

The capability subclass is VIs.

GeC—Gloucester extremely stony sandy loam, 3 to 15 percent slopes. This soil is gently sloping to sloping and somewhat excessively drained. It is on ridges and hills of glacial till uplands. The areas of this soil are mostly irregular in shape and range from 5 to 75 acres. Stones and boulders cover 8 to 25 percent of the surface. Slopes are mainly smooth and convex or undulating and are 100 to 300 feet long.

Typically, this soil has a surface layer of very dark grayish brown sandy loam 4 inches thick. The subsoil is dark yellowish brown and yellowish brown gravelly sandy loam and loamy sand 21 inches thick. The substratum is light olive brown and light brownish gray gravelly loamy coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley soils and well drained Canton, Charlton, and Paxton soils. Also included are a few nearly level areas and small areas where stones and boulders cover less than 8 percent of the surface. Included areas make up about 15 percent of the unit.

The water table in this Gloucester soil is commonly below a depth of 6 feet. The available water capacity is low. Runoff is medium. The soil has rapid permeability and is very strongly acid to medium acid.

Most areas of this soil are in woodland. A few small areas are used for pasture or community development.

This soil generally is too stony and too droughty for cultivation. The soil is suited to woodland, but droughtiness causes a high rate of seedling mortality and the stones and boulders on the surface hinder the use of some woodland harvesting equipment.

This soil is generally suited to community development, but slope is a limitation for onsite septic systems and the rapid permeability causes a hazard of ground-water pollution in areas used for septic tanks. Some slopes of excavations in this soil are unstable. The stones on the surface hinder landscaping.

The capability subclass is VIIs.

GeD—Gloucester extremely stony sandy loam, 15 to 35 percent slopes. This soil is moderately steep to steep and somewhat excessively drained. It is on ridges and hills of glacial till uplands. The areas of this soil are long and narrow and range from 10 to 30 acres. Stones and boulders cover 8 to 25 percent of the surface. Slopes are smooth and convex or undulating and are mostly 100 to 400 feet long.

Typically, this soil has a surface layer of very dark grayish brown sandy loam 4 inches thick. The subsoil is dark yellowish brown and yellowish brown gravelly sandy loam and loamy sand 21 inches thick. The substratum is light olive brown and light brownish gray gravelly loamy coarse sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley soils and well drained Canton, Charlton, and Paxton soils. Also included are a few small areas with slopes of more than 35 percent and a few areas where stones cover less than 8 percent of the surface. Included areas make up about 15 percent of the unit.

The water table in this Gloucester soil is commonly below a depth of 6 feet. The available water capacity is low. Runoff is rapid. The soil has rapid permeability and is very strongly acid to medium acid.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is too stony and too steep for cultivation. The soil is suited to woodland, but droughtiness causes a high rate of seedling mortality and the stones on the surface and the slope hinder the use of some woodland harvesting equipment.

Slope is a major limitation of this soil for community development, especially for onsite septic systems. The rapid permeability of the soil causes a hazard of ground-water pollution in areas used for septic tanks. Some slopes of excavations in this soil are unstable. Stones and boulders on the surface limit landscaping.

The capability subclass is VIIs.

HkA—Hinckley gravelly sandy loam, 0 to 3 percent slopes. This soil is nearly level and excessively drained. It is on terraces of stream valleys and on outwash plains. The areas of this soil are mostly oval or irregular in shape and range from 5 to 30 acres.

Typically, this soil has a surface layer of very dark grayish brown gravelly sandy loam 2 inches thick. The subsoil is dark yellowish brown, yellowish brown, and brownish yellow gravelly sandy loam and gravelly loamy sand 16 inches thick. The substratum is pale yellow gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Windsor soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Sudbury soils. A few small areas have a few stones and boulders on the surface. Included areas make up about 15 percent of the unit.

The water table in this Hinckley soil is commonly below a depth of 6 feet. The available water capacity is low. Runoff is slow. The soil has rapid permeability in the surface layer and subsoil and very rapid permeability in the substratum, and it is extremely acid to medium acid.

Most areas of this soil are used for corn for silage and hay and pasture. A few of the farmed areas are used for vegetables. A few small areas are in woodland, and a few are used for community development.

Irrigated areas of this soil are well suited to cultivated crops; nonirrigated areas are fairly suited. The soil warms and dries early in the spring and is easy to till. Minimum tillage and cover crops help to maintain tilth in cultivated areas.

Droughtiness makes the soil poorly suited to woodland and causes a high rate of seedling mortality.

This soil generally is suited to community development, but the rapid permeability causes a hazard of ground-water pollution in areas used for septic tanks and some slopes of excavations are unstable.

The capability subclass is IIIs.

HkC—Hinckley gravelly sandy loam, 3 to 15 percent slopes. This is a gently sloping to sloping, excessively drained soil on terraces of stream valleys and on glacial outwash plains. The areas of this soil are oval or irregular in shape and range from 5 to 200 acres. Slopes are convex or undulating and are mostly less than 200 feet long.

Typically, the surface layer is very dark grayish brown gravelly sandy loam 2 inches thick (fig. 7). The subsoil is dark yellowish brown, yellowish brown, and brownish yellow gravelly sandy loam and gravelly loamy sand 16 inches thick. The substratum is pale yellow gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Windsor soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Sudbury soils. Also included are a few areas of a soil with a surface layer of fine sandy loam and a few small areas with a few stones on the surface. Included areas make up about 15 percent of the unit.

The water table in this Hinckley soil is commonly below a depth of 6 feet. The available water capacity is low. Runoff is rapid. This soil has rapid permeability in the surface layer and subsoil and very rapid permeability in the substratum, and it is extremely acid to medium acid.

Most areas of this soil are in woodland. Some areas are in cropland, and a few large areas are in community development.

Irrigated areas of this soil are well suited to cultivated crops; nonirrigated areas are fairly suited. The soil dries and warms early in the spring and is easy to till. Minimum tillage and cover crops help to minimize the moderate erosion hazard in cultivated areas.

Droughtiness makes this soil poorly suited to use as woodland; it increases seedling mortality.

Figure 7.—Typical profile of Hinckley gravelly sandy loam, 3 to 15 percent slopes.

This soil generally is suited to community development, but the rapid permeability imposes a hazard of ground-water pollution in areas used for septic tanks. The slopes in some excavated areas are unstable.

The capability subclass is IVs.

HkD—Hinckley gravelly sandy loam, 15 to 40 percent slopes. This soil is moderately steep to very steep and excessively drained. It is on side slopes and terrace breaks of stream valleys and outwash plains. The areas of this soil are long and narrow or irregularly shaped and range from 5 to 60 acres. Slopes are convex or undulating and are mostly less than 300 feet long.

Typically, the surface layer is very dark grayish brown gravelly sandy loam about 2 inches thick. The subsoil is dark yellowish brown, yellowish brown, and brownish yellow gravelly sandy loam and gravelly loamy sand 16 inches thick. The substratum is pale yellow gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Windsor soils, somewhat excessively drained Merrimac soils, and well drained Agawam soils. Included areas make up about 15 percent of the unit.

The water table in this Hinckley soil is commonly below a depth of 6 feet. The available water capacity is low. Runoff is rapid. This soil has rapid permeability in the surface layer and subsoil and very rapid permeability in the substratum, and it is extremely acid to medium acid.

Most areas of this soil are in woodland. A few areas are in pasture or hay.

Slope and a severe erosion hazard make this soil poorly suited to cultivated crops. Maintaining a permanent plant cover helps to control runoff and erosion in cultivated areas.

This soil is suited to woodland, but droughtiness causes a high rate of seedling mortality and slope hinders the use of some harvesting equipment.

Slope is the major limitation of this soil for community development. The rapid permeability causes a hazard of ground-water pollution in areas used for septic tanks.

The capability subclass is VIIs.

HrC—Hollis-Charlton-Rock outcrop complex, 3 to 15 percent slopes. This unit consists of gently sloping to sloping, somewhat excessively drained and well drained soils and areas of exposed bedrock. The unit is on hills and ridges of glacial till uplands in long and narrow or irregularly shaped areas that range from 5 to 60 acres (fig. 8). Slopes are mostly convex and 100 to 200 feet long. Stones cover 8 to 25 percent of the surface, which is marked by narrow, intermittent drainageways and a few small, wet depressions. The unit is about 35 percent Hollis soils, 30 percent Charlton soils, 15 percent exposed bedrock, and 20 percent other soils. The Hollis and Charlton soils and exposed rock are in such a complex pattern that it was not practical to map them separately.

Typically, the Hollis soils have a surface layer of dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown gravelly fine sandy loam 12 inches thick. Hard, unweathered schist bedrock is at a depth of 14 inches.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with this unit in mapping are small areas of somewhat excessively drained Gloucester soils, well drained Canton and Charlton soils, moderately well drained Sutton soils, and poorly drained Leicester soils.

The water table in this unit is commonly below a depth of 6 feet. The available water capacity is very low or low in the Hollis soils and moderate in the Charlton soils. Both soils have moderate or moderately rapid permeability and medium to rapid runoff, and both are very strongly acid to medium acid.

Figure 8.—An area of Hollis-Charlton-Rock outcrop complex, 3 to 15 percent slopes.

Most areas of this unit are in woodland. A few small areas are in pasture.

This unit is too stony for cultivation. The stones on the surface, the areas of exposed rock, and the depth to bedrock in the Hollis soils make the unit poorly suited to woodland and are the major limitations for community development. Droughtiness in the Hollis soils causes a high rate of seedling mortality, and trees on the Hollis soils are subject to uprooting because of the depth to bedrock.

The capability subclass is VIs.

HrD—Hollis-Charlton-Rock outcrop complex, 15 to 35 percent slopes. This unit consists of moderately steep to steep, somewhat excessively drained and well drained soils and areas of exposed bedrock. The unit is on hills and ridges of glacial till uplands in long and narrow or irregularly shaped areas that range from 5 to 40 acres. Slopes are mostly convex and 100 to 400 feet long. Stones cover 8 to 25 percent of the surface, which is marked by a few small, intermittent drainageways. This unit is about 35 percent Hollis soils, 30 percent Charlton soils, 15 percent exposed bedrock, and 20 percent other soils. The Hollis and Charlton soils and exposed rock are in such a complex pattern that it was not practical to map them separately.

Typically, the Hollis soils have a surface layer of dark grayish brown fine sandy loam 2 inches thick. The subsoil is yellowish brown gravelly fine sandy loam 12 inches thick. Hard, unweathered schist bedrock is at a depth of 14 inches.

Typically, the Charlton soils have a surface layer of dark yellowish brown fine sandy loam 5 inches thick. The subsoil is yellowish brown fine sandy loam and sandy loam 20 inches thick. The substratum is light yellowish brown and light brownish gray sandy loam to a depth of 60 inches or more.

Included with this unit in mapping are small areas of somewhat excessively drained Gloucester soils, well drained Canton and Charlton soils, and poorly drained Leicester soils. Also included are a few areas where stones and boulders cover less than 8 percent of the surface.

The water table in this unit is commonly below a depth of 6 feet. The available water capacity is very low or low

in the Hollis soils and moderate in the Charlton soils. Both soils have moderate or moderately rapid permeability and medium to rapid runoff, and both are very strongly acid to medium acid.

Most areas of this unit are in woodland. A few small areas are used for pasture.

This unit is too stony for cultivation. The depth to bedrock in the Hollis soils, the stones on the surface, the areas of exposed rock, and the slope make the unit poorly suited to woodland and are major limitations for community development. Droughtiness causes a high rate of seedling mortality on the Hollis soils, and trees on the Hollis soils are subject to uprooting during windy periods because of the depth to bedrock.

The capability subclass is VIIs.

MyA—Merrimac sandy loam, 0 to 3 percent slopes. This soil is nearly level and somewhat excessively drained. It is on terraces and outwash plains in stream valleys. The areas are irregular in shape and mostly range from 10 to 70 acres.

Typically, the surface layer is dark brown sandy loam 8 inches thick. The subsoil is yellowish brown sandy loam and loamy sand 16 inches thick. The substratum is yellowish brown gravelly sand and stratified sand and gravel to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley and Windsor soils, well drained Agawam soils, and moderately well drained Sudbury soils. A few large areas have a surface layer of fine sandy loam. Included areas make up about 15 percent of the unit.

The water table in this Merrimac soil is commonly below a depth of 6 feet. The available water capacity is moderate. This soil has moderately rapid permeability in the surface layer and upper part of the subsoil, moderately rapid or rapid permeability in the lower part of the subsoil, and rapid permeability in the substratum. Runoff is slow. The soil is extremely acid to medium acid.

Most areas of this soil are in cropland. A few areas are in woodland, and a few are used for community development or recreation.

This soil is well suited to cultivated crops, but it is droughty during extended dry periods. Minimum tillage and cover crops help to maintain tilth in cultivated areas.

The soil is suited to woodland, but droughtiness causes a moderate rate of seedling mortality.

This soil generally is suited to community development, but the rapid permeability of the substratum causes a hazard of pollution to the ground water in areas used for septic tanks. Some slopes of excavations in this soil are unstable.

The capability subclass is IIs.

MyB—Merrimac sandy loam, 3 to 8 percent slopes. This soil is gently sloping and somewhat excessively drained. It is on terraces and outwash plains of stream valleys. The areas are irregular in shape and mostly range from 5 to 40 acres. Slopes are smooth and convex and less than 200 feet long.

Typically, the surface layer is dark brown sandy loam 8 inches thick. The subsoil is yellowish brown sandy loam and loamy sand 16 inches thick. The substratum is yellowish brown gravelly sand and stratified sand and gravel to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley and Windsor soils, well drained Agawam soils, and moderately well drained Sudbury soils. A few large areas have a surface layer of fine sandy loam. Included areas make up about 15 percent of the unit.

The water table in this Merrimac soil is commonly below a depth of 6 feet. The available water capacity is moderate. This soil has moderately rapid permeability in the surface layer and upper part of the subsoil, moderately rapid or rapid permeability in the lower part of the subsoil, and rapid permeability in the substratum. Runoff is slow to medium. The soil is extremely acid to medium acid.

Most areas of this soil are in cropland. A few areas are in woodland, and a few are used for community development or recreation.

This soil is well suited to cultivated crops, but it is droughty during extended dry periods and has a moderate erosion hazard. Cover crops and minimum tillage help to control runoff and erosion in cultivated areas.

The soil is suited to woodland, but droughtiness causes a moderate rate of seedling mortality.

This soil generally is suited to community development, but the rapid permeability of the substratum causes a hazard of pollution to the ground water in areas used for septic tanks. Some slopes of excavations in this soil are unstable.

The capability subclass is IIs.

Nn—Ninigret fine sandy loam. This soil is nearly level to gently sloping and moderately well drained. It is in slight depressions of stream terraces and outwash plains. Slopes range from 0 to 5 percent. The areas of this soil are irregular in shape and mostly range from 5 to 30 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mostly mottled, yellowish brown and light olive brown fine sandy loam and is about 17 inches thick. The substratum is yellowish brown and light olive brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Agawam soils, moderately well drained Sudbury soils, and poorly drained Walpole soils. Some small areas have a few stones on the surface, and a few large areas have a surface layer of silt loam. Included areas make up about 10 percent of the unit.

This Ninigret soil has a seasonal water table at a depth of about 20 inches from fall to spring. The

available water capacity of the soil is moderate. The soil has moderately rapid permeability in the surface layer and subsoil and rapid permeability in the substratum. Runoff is slow to medium. The soil is very strongly acid to medium acid.

Most areas of this soil are in cropland. A few areas are in woodland. Some areas are used for community development or recreation.

This soil is well suited to woodland and cultivated crops. Providing drainage to alleviate wetness in early spring is a main crop management concern. Minimum tillage and cover crops help to maintain tilth in cultivated areas.

The seasonal high water table is the main limitation of this soil for community development. The water table and the rapid permeability in the substratum cause a hazard of ground-water pollution in areas used for septic tanks. Some slopes of excavations in this soil are unstable.

The capability subclass is IIw.

On—Occum fine sandy loam. This soil is nearly level and well drained. It is on flood plains along major streams and their tributaries. The areas are long and narrow or irregular in shape and range from 5 to 30 acres. Slopes range from 0 to 3 percent.

Typically, the surface layer is dark grayish brown fine sandy loam 8 inches thick. The subsoil is dark yellowish brown and yellowish brown fine sandy loam 27 inches thick. The substratum is yellowish brown and dark yellowish brown loamy fine sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Suncook soils, well drained Agawam soils, moderately well drained Pootatuck soils, and poorly drained Rippowam soils. Included areas make up about 10 percent of the unit.

This Occum soil has a water table that is commonly below a depth of 6 feet. The soil is subject to frequent flooding, mainly from fall to spring. The available water capacity is moderate. This soil has moderately rapid permeability in the surface layer and subsoil and rapid permeability in the substratum. Runoff is slow. This soil is very strongly acid to medium acid.

This soil is mostly used for corn for silage and hay and pasture. A few areas are in woodland.

This soil is well suited to woodland and cultivated crops. The soil is seldom flooded during the growing season. Minimum tillage and cover crops help to maintain tilth in cultivated areas.

Frequent flooding is the main limitation of the soil for community development.

The capability class is I.

PbB—Paxton fine sandy loam, 3 to 8 percent slopes. This soil is gently sloping and well drained. It is on the tops and side slopes of drumlins and hills of glacial till uplands. The areas are mostly oval or irregular in shape and range from 5 to 40 acres.

Typically, the surface layer is dark brown fine sandy loam 7 inches thick. The subsoil is yellowish brown and dark yellowish brown fine sandy loam 18 inches thick. The substratum is firm to very firm, olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat excessively drained Hollis soils, well drained Charlton soils, moderately well drained Woodbridge soils, and poorly drained Ridgebury soils. Also included are a few areas of nearly level soils, a few small areas of soils that have stones on the surface, a few large areas of soils that have a surface layer of silt loam, and a few areas of soils that have a substratum of loamy sand. The included soils make up about 10 percent of the unit.

This Paxton soil has a seasonal high water table perched at a depth of about 2 feet for several weeks in the spring. The available water capacity of the soil is moderate. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is medium. The soil is very strongly acid to slightly acid.

This soil is mostly used for corn for silage, hay and pasture, and a few vegetables. A few areas are in fruit orchards. A small acreage is in woodland, and some areas are used for community development or recreation.

This soil is well suited to woodland and cultivated crops. Minimum tillage, cover crops, and diversions and grassed waterways help to control a moderate hazard of erosion in cultivated areas.

The slow or very slow permeability of the substratum is the main limitation of this soil for community development, especially for onsite septic systems. Steep slopes of excavations in this soil slump when saturated. Lawns are commonly soggy in autumn and early in spring.

The capability subclass is IIe.

PbC—Paxton fine sandy loam, 8 to 15 percent slopes. This soil is sloping and well drained. It is on side slopes of drumlins and hills of glacial till uplands. The areas are mostly oval or long and narrow and range from 4 to 20 acres.

Typically, the surface layer is dark brown fine sandy loam 7 inches thick. The subsoil is yellowish brown and dark yellowish brown fine sandy loam 18 inches thick. The substratum is very firm to firm, olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat excessively drained Hollis soils, well drained Charlton soils, moderately well drained Woodbridge soils, and poorly drained Ridgebury soils. A few small areas have stones on the surface, and a few large areas have a substratum of loamy sand. Included areas make up about 10 percent of the unit.

This Paxton soil has a seasonal high water table perched at a depth of about 2 feet for several weeks in the spring. The available water capacity of the soil is

moderate. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is rapid. The soil is very strongly acid to slightly acid.

This soil is mostly used for corn for silage, hay and pasture, and a few vegetables. A few areas are in fruit orchards or woodland, and a few are used for community development or recreation.

This soil is well suited to woodland and cultivated crops. Minimum tillage, stripcropping, cover crops, and diversions and grassed waterways help to control a severe erosion hazard in cultivated areas.

Slope and the slow or very slow permeability of the substratum limit this soil for community development, especially for onsite septic systems. Steep slopes of excavations in this soil slump when saturated. Lawns are commonly soggy in autumn and spring.

The capability subclass is IIIe.

PbD—Paxton fine sandy loam, 15 to 25 percent slopes. This soil is moderately steep and well drained. It is on the side slopes of drumlins and hills of glacial till uplands. The areas are mostly oval or long and narrow and range from 4 to 20 acres.

Typically, the surface layer is dark brown fine sandy loam 7 inches thick. The subsoil is yellowish brown and dark yellowish brown fine sandy loam 18 inches thick. The substratum is very firm to firm, dark yellowish brown and yellowish brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat excessively drained Hollis soils, well drained Charlton soils, moderately well drained Woodbridge soils, and poorly drained Ridgebury soils. Also included are a few small areas that have stones on the surface and a few large areas with a substratum of loamy sand. Included areas make up about 10 percent of the unit.

This Paxton soil has a seasonal high water table perched at a depth of about 2 feet for several weeks in the spring. The available water capacity of the soil is moderate. The soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is rapid. The soil is very strongly acid to slightly acid.

This soil is mostly used for hay or pasture. A few areas are in woodland, and a few are in community development.

Slope and a severe erosion hazard hinder the use of some types of farming equipment and make this soil poorly suited to cultivated crops. The soil, however, is well suited to woodland.

Slope and the slow to very slow permeability of the substratum are major limitations of this soil for community development, especially for onsite septic systems. Steep slopes of excavations in this soil slump when saturated. Lawns are commonly soggy in autumn and spring.

The capability subclass is IVe.

PdB—Paxton very stony fine sandy loam, 3 to 8 percent slopes. This soil is gently sloping and well drained. It is on the tops and side slopes of drumlins and large hills of glacial till uplands. The areas are mostly oval or irregular in shape and range from 3 to 50 acres. Stones and boulders cover 1 to 8 percent of the surface.

Typically, the surface layer is dark brown fine sandy loam 7 inches thick. The subsoil is yellowish brown and dark yellowish brown fine sandy loam 18 inches thick. The substratum is very firm to firm, olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat excessively drained Hollis soils, well drained Charlton soils, moderately well drained Woodbridge soils, and poorly drained Ridgebury soils. Also included are a few nearly level areas and small areas that have no stones on the surface. A few large areas have a substratum of loamy sand. Included areas make up about 10 percent of the unit.

This Paxton soil has a seasonal high water table perched at a depth of about 2 feet for several weeks in the spring. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is medium. The soil has moderate available water capacity and is very strongly acid to slightly acid.

This soil is mostly in woodland. A few areas are in pasture or community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stone removal makes the soil well suited to cultivated crops but is difficult. Cover crops and minimum tillage help to control erosion and maintain tilth in cultivated areas.

The slow to very slow permeability of the substratum limits this soil for community development, especially for onsite septic systems. Steep slopes of excavations in this soil slump when saturated. Lawns are commonly soggy in autumn and spring. The stones on the surface hinder landscaping.

The capability subclass is VIs.

PdC—Paxton very stony fine sandy loam, 8 to 15 percent slopes. This soil is sloping and well drained. It is on the side slopes of drumlins and hills of glacial till uplands. The areas are mostly oval or irregular in shape and range from 4 to 20 acres. Stones and boulders cover 1 to 8 percent of the surface.

Typically, the surface layer is dark brown fine sandy loam 7 inches thick. The subsoil is yellowish brown and dark yellowish brown fine sandy loam 18 inches thick. The substratum is very firm to firm, olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat excessively drained Hollis soils, well drained Charlton soils, moderately well drained Woodbridge soils, and poorly drained Ridgebury soils. Also included are a few small areas with no stones on the surface and a few large areas that have a substratum of loamy sand. Included areas make up about 10 percent of the unit.

This Paxton soil has a seasonal high water table perched at a depth of about 2 feet for several weeks in the spring. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is rapid. The soil has moderate available water capacity and is very strongly acid to slightly acid.

This soil is mostly in woodland. A few areas are in pasture or community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stone removal makes this soil suited to cultivated crops but is difficult. Maintaining a permanent plant cover helps to control erosion in cultivated areas.

Slope and the slow or very slow permeability of the substratum limit this soil for community development, especially for onsite septic systems. Steep slopes of excavations in this soil slump when saturated. Lawns are commonly soggy in autumn and spring. The stones on the surface hinder landscaping.

The capability subclass is VIs.

PeC—Paxton extremely stony fine sandy loam, 3 to 15 percent slopes. This soil is gently sloping to sloping and well drained. It is on the tops and side slopes of drumlins and large hills of glacial till uplands. The areas are mostly oval or irregular in shape and range from 5 to 60 acres. Stones and boulders cover 8 to 25 percent of the surface.

Typically, the surface layer is dark brown fine sandy loam 7 inches thick. The subsoil is yellowish brown and dark yellowish brown fine sandy loam 18 inches thick. The substratum is very firm to firm, olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat excessively drained Hollis soils, well drained Charlton soils, moderately well drained Woodbridge soils, and poorly drained Ridgebury soils. A few small areas have no stones on the surface, and a few large areas have a substratum of loamy sand. Included areas make up about 15 percent of the unit.

This Paxton soil has a seasonal high water table perched at a depth of about 2 feet for several weeks in the spring. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is medium to rapid. The soil has moderate available water capacity and is very strongly acid to slightly acid.

This soil is mostly in woodland. A few areas are in pasture or community development.

This soil generally is too stony for cultivation. Stone removal makes the soil well suited to cultivated crops but is difficult. Maintaining a permanent plant cover helps to control a moderate to severe erosion hazard in cultivated areas.

The soil is well suited to woodland, but the stones on the surface hinder the use of some types of harvesting equipment.

Slope and the slow or very slow permeability of the substratum limit this soil for community development, especially for onsite septic systems. Steep slopes of excavations in this soil slump when saturated. Lawns are commonly soggy in autumn and spring.

The capability subclass is VIIs.

PeD—Paxton extremely stony fine sandy loam, 15 to 35 percent slopes. This soil is moderately steep to steep and well drained. It is on side slopes of drumlins and hills of glacial till uplands. Areas of this soil are mostly oval or long and narrow and range from 5 to 25 acres. Stones and boulders cover 8 to 25 percent of the surface.

Typically, the surface layer is dark brown fine sandy loam 7 inches thick. The subsoil is yellowish brown and dark yellowish brown fine sandy loam 18 inches thick. The substratum is very firm to firm, olive brown fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat excessively drained Hollis soils, well drained Charlton soils, and moderately well drained Woodbridge soils. Also included are a few large areas where stones cover less than 8 percent of the surface and a few areas that have a substratum of loamy sand. Included areas make up about 15 percent of the unit.

This Paxton soil has a seasonal high water table perched at a depth of about 2 feet for several weeks in the spring. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is rapid. The soil has moderate available water capacity and is very strongly acid to slightly acid.

This soil is mostly in woodland. A few areas are used for pasture or community development.

This soil generally is too stony and too steep for cultivation. The soil is well suited to woodland, but the stones and slope hinder the use of some types of harvesting equipment.

Slope and the slow or very slow permeability of the substratum are major limitations of this soil for community development, especially for onsite septic systems. Steep slopes of excavations in this soil slump when saturated. Lawns are soggy in autumn and spring.

The capability subclass is VIIs.

Pr—Pits, gravel. This unit consists of irregularly shaped areas that have been excavated for sand and gravel. The areas are mostly on outwash plains and terraces of stream valleys and range from 3 to 60 acres. Slopes mainly range from 0 to 25 percent but are steeper on escarpments along the edge of the pit.

Included with this unit in mapping are small intermingled areas of Udorthents, excessively drained Hinckley and Windsor soils, somewhat excessively drained Merrimac and Gloucester soils, and moderately well drained Ninigret and Sudbury soils. Also included are a few small bodies of water. Included areas make up about 20 percent of the unit.

The water table in this unit is commonly below a depth of 60 inches, but in a few places it is near the surface. A few areas adjacent to streams are subject to flooding. The permeability of this unit is rapid or very rapid.

Areas of this unit require onsite investigation and evaluation to determine the suitability for most uses.

This unit is not assigned to a capability subclass.

Ps—Pootatuck fine sandy loam. This soil is nearly level and moderately well drained. It is on flood plains of major streams and their tributaries. The areas are irregular in shape or long and narrow and range from 15 to 45 acres. Slopes range from 0 to 3 percent.

Typically, the surface layer is very dark grayish brown fine sandy loam 5 inches thick. The subsoil is dark brown, yellowish brown, and brown, mottled fine sandy loam and sandy loam 22 inches thick. The substratum is olive brown and grayish brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Suncook soils, well drained Occum soils, and poorly drained Rippowam soils. Also included are a few large areas that have a surface layer of silt loam. Included areas make up about 10 percent of the unit.

This Pootatuck soil has a seasonal high water table at a depth of about 20 inches from fall through spring. The soil is subject to frequent flooding, mainly from fall through spring. This soil has moderate or moderately rapid permeability in the surface layer and subsoil and moderately rapid or rapid permeability in the substratum. Runoff is slow. The soil has moderate available water capacity and is very strongly acid to medium acid.

This soil is mostly used for corn for silage and hay and pasture. A few areas are in woodland.

This soil is well suited to woodland and cultivated crops. The soil is seldom flooded during the growing season, but the seasonal high water table causes the soil to dry and warm slowly in the spring, which sometimes delays planting. Minimum tillage and the use of cover crops help to maintain tilth in cultivated areas.

Flooding is a major limitation of this soil for community development.

The capability subclass is IIw.

Rd—Ridgebury fine sandy loam. This soil is nearly level and poorly drained. It is on concave slopes, in depressions, and in small drainageways of glacial till uplands. The areas are irregular in shape and range from 10 to 50 acres. This soil has slopes of 0 to 3 percent.

Typically, the surface layer is very dark brown fine sandy loam 8 inches thick. The subsoil is mottled, light brownish gray fine sandy loam 8 inches thick. The substratum is very firm to firm, grayish brown and light brownish gray fine sandy loam and sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of moderately well drained Sutton and Woodbridge soils, poorly drained Leicester soils, and very poorly drained Whitman soils. Also included are a few small areas that have stones on the surface and a few large areas that have a friable substratum. Included areas make up about 10 percent of the unit.

This Ridgebury soil has a seasonal high water table at a depth of about 10 inches from fall to spring. This soil has moderate or moderately rapid permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is slow. The soil has moderate available water capacity and is very strongly acid to medium acid.

This soil is mostly in woodland. Some areas are used for pasture or hay, and a few areas are used for corn for silage.

Drained areas of this soil are suited to cultivated crops. The seasonal high water table causes the soil to dry and warm slowly in the spring, which sometimes delays planting and makes undrained areas poorly suited to most crops. The use of cover crops in cultivated areas helps to maintain the tilth of the soil.

The seasonal high water table makes this soil poorly suited to woodland. The water table causes a high rate of seedling mortality and hinders the use of some types of harvesting equipment. The shallow rooting zone above the water table causes a hazard of uprooting during windy periods.

The seasonal water table and the slow to very slow permeability of the substratum are major limitations of this soil for community development, especially for onsite septic systems. Steep slopes of excavations in this soil slump when saturated. Lawns are commonly soggy in fall and spring and after heavy rains during the summer.

The capability subclass is IIIw.

Rn—Ridgebury, Leicester, and Whitman extremely stony fine sandy loams. This unit consists of nearly level, poorly drained and very poorly drained soils in depressions and drainageways of glacial till uplands. The areas are mostly long and narrow or irregular in shape and range from 5 to 150 acres. Slopes range from 0 to 3 percent and are mainly 100 to 300 feet long. Stones cover 8 to 25 percent of the surface. About 40 percent of the total acreage of this unit is Ridgebury soils, 35 percent is Leicester soils, 15 percent is Whitman soils, and 10 percent is other soils. Some areas of this unit consist of one of these soils, and some others consist of two or three. The soils of this unit were mapped together because they have no significant differences in use and management.

Typically, the Ridgebury soils have a surface layer of very dark brown fine sandy loam 8 inches thick. The subsoil is mottled, light brownish gray fine sandy loam 8 inches thick. The substratum is very firm to firm, grayish brown and light brownish gray fine sandy loam and sandy loam to a depth of 60 inches or more.

Typically, the Leicester soils have a surface layer of very dark brown fine sandy loam 7 inches thick. The

subsoil is mottled, grayish brown and light olive brown fine sandy loam 23 inches thick. The substratum is mottled, light olive brown and grayish brown sandy loam to a depth of 60 inches or more.

Typically, the Whitman soils have a surface layer of very dark gray fine sandy loam 9 inches thick. The subsoil is gray, mottled fine sandy loam 5 inches thick. The substratum is mottled, light olive gray fine sandy loam and sandy loam to a depth of 60 inches or more.

Included with this unit in mapping are small areas of moderately well drained Sutton and Woodbridge soils and very poorly drained Adrian and Palms soils. Also included are a few areas where stones cover less than 8 percent of the surface.

The Ridgebury soils have a seasonal high water table at a depth of about 10 inches from fall through spring. The permeability of the soils is moderate to moderately rapid in the surface layer and subsoil and slow to very slow in the substratum. Runoff is slow. The Ridgebury soils have moderate available water capacity and are very strongly acid to medium acid.

The Leicester soils have a seasonal high water table at a depth of about 10 inches from fall through spring. The permeability of the soils is moderate or moderately rapid. Runoff is slow. The Leicester soils have moderate available water capacity and are very strongly acid to medium acid.

The Whitman soils have a seasonal high water table at or near the surface from fall through spring. The permeability of the soils is moderate or moderately rapid in the surface layer and subsoil and slow to very slow in the substratum. Runoff is slow. The Whitman soils have moderate available water capacity and are very strongly acid to slightly acid.

This unit is mostly in woodland. A few small areas are used for pasture or community development.

The soils of this unit are too stony for cultivation. The unit is suited to woodland. However, the stones on the surface and the high water table hinder the use of harvesting equipment. The water table causes a high rate of seedling mortality and restricts rooting, causing a hazard of uprooting during windy periods.

The high water table and slow to very slow permeability are major limitations of the soils of this unit for community development. Steep slopes of excavations in these soils slump when saturated. The stones on the surface restrict landscaping, and lawns are soggy most of the year.

The capability subclass is VIIs.

Ru—Rippowam fine sandy loam. This soil is nearly level and poorly drained. It is on the lowest parts of the flood plains of major streams and their tributaries. The areas are mostly long and narrow and range from 5 to 100 acres. Slopes range from 0 to 3 percent.

Typically, the surface layer is very dark gray fine sandy loam 7 inches thick. The subsoil is dark brown, grayish brown, and dark grayish brown, mottled fine sandy loam 28 inches thick. The substratum is grayish brown and gray gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of moderately well drained Pootatuck soils, poorly drained Leicester soils, and very poorly drained Saco soils. Also included are a few large areas with a surface layer and subsoil of silt loam. Included areas make up about 20 percent of the unit.

This Rippowam soil has a seasonal high water table at a depth of about 10 inches from fall through spring. The soil is subject to frequent flooding, mainly from fall to spring. It has moderate or moderately rapid permeability in the surface layer and subsoil and rapid or very rapid permeability in the substratum. Runoff is slow. The soil has moderate available water capacity and is very strongly acid to medium acid.

This soil is mostly in woodland. Some areas are in hay or pasture or are used for corn for silage.

Drained areas of this soil are suited to cultivated crops. The seasonal high water table causes the soil to dry slowly in the spring, often delaying planting and making undrained areas poorly suited to cultivation.

The soil is suited to woodland, but the water table causes a high rate of seedling mortality and restricts the use of some types of harvesting equipment for part of the year.

Frequent flooding and the seasonal high water table are major limitations of this soil for community development. Steep slopes of excavations in this soil are unstable, and lawns are soggy from fall through spring. The rapid permeability in the substratum causes a hazard of ground-water pollution in areas used for septic tanks.

The capability subclass is IIIw.

Sb—Saco silt loam. This soil is nearly level and very poorly drained. It is on the low parts of the flood plains of major streams and their tributaries. The areas are mostly long and narrow or irregular in shape and range from 10 to 150 acres. Slopes range from 0 to 2 percent.

Typically, the surface layer is black silt loam about 14 inches thick. It is mottled in the lower 4 inches. The substratum extends to a depth of 60 inches or more. The upper part is mottled, dark gray silt loam, and the lower part is gray stratified sand and gravel.

Included with this soil in mapping are small areas of poorly drained Rippowam and Leicester soils and very poorly drained Adrian, Whitman, and Palms soils. Also included are a few areas that have a sandy substratum at a depth of less than 40 inches. Included areas make up about 25 percent of the unit.

The water table in this Saco soil is at or near the surface during most of the year, and the soil is subject to frequent flooding. The soil has moderate permeability in the surface layer and upper part of the substratum and rapid or very rapid permeability in the lower part of the substratum. Runoff is slow. The soil has high available water capacity and is strongly acid to medium acid

above a depth of 40 inches and medium acid to slightly acid below 40 inches.

This soil is mostly in woodland. A few small areas are used for pasture.

Flooding and the high water table make this soil generally unsuitable for most uses other than as wetland wildlife habitat.

The capability subclass is VIw.

Sf—Scarboro fine sandy loam. This soil is nearly level and very poorly drained. It is in low depressions of outwash plains and terraces. The areas are mostly irregular in shape and range from 3 to 25 acres. Slopes range from 0 to 2 percent.

Typically, the surface layer consists of 4 inches of black muck over a 14-inch layer of very dark gray, black, and dark grayish brown fine sandy loam and sandy loam. The substratum is grayish brown loamy sand and sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of poorly drained Walpole soils and very poorly drained Adrian and Palms soils. Included areas make up about 10 percent of the unit.

This Scarboro soil has a seasonal high water table at or near the surface from fall until late spring. The soil has rapid permeability in the surface layer and very rapid permeability in the substratum. Runoff is slow, and water is on the surface of some areas. The soil has low available water capacity and is very strongly acid to medium acid.

This soil is mostly in woodland. A few small areas are in pasture.

The seasonal high water table makes this soil unsuited to cultivated crops and poorly suited to woodland. The water table restricts the use of equipment and causes a high rate of seedling mortality. The water table is also a major limitation for community development.

The capability subclass is Vw.

Sg—Sudbury sandy loam. This soil is nearly level to gently sloping and moderately well drained. It is in slight depressions of outwash plains and stream terraces. The areas are mostly oval or irregular in shape and range from 4 to 20 acres. Slopes range from 0 to 5 percent.

Typically, the surface layer is dark brown sandy loam 10 inches thick. The subsoil is mottled, yellowish brown and strong brown sandy loam, gravelly sandy loam, and gravelly loamy sand 18 inches thick. The substratum is light brownish gray and dark gray stratified sand and gravel to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat excessively drained Merrimac soils, well drained Agawam soils, moderately well drained Ninigret soils, and poorly drained Walpole soils. Included areas make up about 10 percent of the unit.

This Sudbury soil has a seasonal high water table at a depth of about 20 inches from fall through spring. The soil has moderately rapid permeability in the surface layer and subsoil and rapid permeability in the substratum. Runoff is slow. The soil has moderate available water capacity and is very strongly acid to medium acid.

This soil is mostly used for corn for silage and hay and pasture. A few areas are in woodland, and some are used for community development or recreation.

This soil is well suited to woodland and cultivated crops. The seasonal high water table is the main limitation for crops. It causes the soil to dry and warm slowly in the spring. Artificial drainage helps to dry the soil earlier in the spring, but even if drained, the soil remains wet for several days after heavy rains. Minimum tillage and cover crops help to maintain tilth in cultivated areas.

The seasonal high water table is the main limitation of this soil for community development. Steep slopes of excavations in this soil are unstable. Lawns are soggy in autumn and spring. The rapid permeability in the substratum causes a hazard of ground-water pollution in areas used for septic tanks.

The capability subclass is IIw.

St—Suncook loamy fine sand. This soil is nearly level and excessively drained. It is on the flood plains of major streams and their tributaries. The areas are long and narrow or oval and range from 5 to 30 acres. Slopes range from 0 to 3 percent.

Typically, the surface layer is dark brown loamy fine sand 9 inches thick. The substratum is dark yellowish brown, yellowish brown, and dark brown loamy sand and sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Agawam and Occum soils and moderately well drained Pootatuck soils. Included areas make up about 10 percent of the unit.

The depth to the water table in this Suncook soil ranges from 3 feet to more than 6 feet, but the water table is commonly at a depth of more than 6 feet. This soil is subject to flooding for brief periods from autumn to spring. The soil has low available water capacity and rapid or very rapid permeability. Runoff is slow. The soil is very strongly acid to slightly acid.

Irrigated areas of this soil are well suited to cultivated crops. The soil warms early in the spring and is easy to work. This soil is well suited to vegetables. Minimum tillage, cover crops, and returning crop residue to the soil help to maintain tilth in cultivated areas.

Droughtiness makes this soil poorly suited to woodland; the rate of seedling mortality is high.

The hazard of flooding limits this soil for community development. Steep slopes of excavations in this soil are unstable.

The capability subclass is IIIs.

SvA—Sutton fine sandy loam, 0 to 3 percent slopes. This soil is nearly level and moderately well drained. It is near the base of hills and in depressions of

glacial till uplands. The areas are mostly oval or irregular in shape and range from 4 to 20 acres.

Typically, the surface layer is dark brown fine sandy loam 5 inches thick. The subsoil is mottled, yellowish brown fine sandy loam and sandy loam 30 inches thick. The substratum is mottled, light olive brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton, and Paxton soils; moderately well drained Woodbridge soils; and poorly drained Leicester soils. A few areas have stones on the surface. Included areas make up about 10 percent of the unit.

This Sutton soil has a seasonal high water table at a depth of about 20 inches from autumn to spring. This soil has moderate or moderately rapid permeability. Runoff is slow. The soil has moderate available water capacity and is very strongly acid to medium acid.

This soil is mostly used for corn for silage and hay and pasture. A few areas are in woodland, and a few are in community development.

This soil is well suited to woodland and cultivated crops. The seasonal high water table is the main limitation for crops. It causes the soil to dry slowly in the spring and remain wet for several days after heavy rains, restricting the use of some types of farming equipment. Providing drainage helps dry this soil earlier in the spring, but even drained areas remain wet for several days after heavy rains. Minimum tillage and cover crops help to maintain tilth in cultivated areas.

The seasonal high water table is the main limitation of this soil for community development, especially for homesites and onsite septic systems. Lawns on this soil are soggy in autumn and spring.

The capability subclass is IIw.

SvB—Sutton fine sandy loam, 3 to 8 percent slopes. This soil is gently sloping and moderately well drained. It is near the base of slopes and in slight depressions in glacial till uplands. The areas are mostly long and narrow or irregular in shape and range from 4 to 50 acres. Slopes are smooth and concave.

Typically, the surface layer is dark brown fine sandy loam 5 inches thick. The subsoil is mottled, yellowish brown fine sandy loam and sandy loam 30 inches thick. The substratum is mottled, light olive brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton, and Paxton soils; moderately well drained Woodbridge soils; and poorly drained Leicester soils. A few small areas have stones on the surface. Included areas make up about 15 percent of the unit.

This Sutton soil has a seasonal high water table at a depth of about 20 inches from fall to spring. This soil has moderate or moderately rapid permeability. Runoff is medium. The soil has moderate available water capacity and is very strongly acid to medium acid.

This soil is mostly used for corn for silage and hay and pasture. A few areas are in woodland, and a few are in community development.

This soil is well suited to woodland and cultivated crops. The seasonal high water table is the main limitation for crops. It causes the soil to dry slowly in the spring, restricting the use of farming equipment. Providing drainage helps to dry this soil earlier in the spring, but even drained areas remain wet for several days after heavy rains. Minimum tillage and cover crops help to maintain tilth and control a moderate erosion hazard in cultivated areas.

The seasonal high water table is the main limitation of this soil for community development, especially for homesites and onsite septic systems. Lawns on this soil are soggy in autumn and spring.

The capability subclass is IIw.

SwA—Sutton very stony fine sandy loam, 0 to 3 percent slopes. This soil is nearly level and moderately well drained. It is on the lower slopes of hills and in slight depressions in glacial till uplands. The areas are mostly oval or irregular in shape and range from 4 to 30 acres. Stones cover 1 to 8 percent of the surface.

Typically, the surface layer is dark brown fine sandy loam 5 inches thick. The subsoil is mottled, yellowish brown fine sandy loam and sandy loam 30 inches thick. The substratum is mottled, light olive brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton, and Paxton soils; moderately well drained Woodbridge soils; and poorly drained Leicester soils. A few small areas do not have stones on the surface. Included areas make up about 10 percent of the unit.

This Sutton soil has a seasonal high water table at a depth of about 20 inches from fall to spring. This soil has moderate or moderately rapid permeability. Runoff is slow. The soil has moderate available water capacity and is very strongly acid to medium acid.

This soil is mostly in woodland. A few areas are in pasture, and a few are in community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stones hinder the use of farming equipment and are difficult to remove. The seasonal high water, which causes the soil to dry slowly in the spring, is an additional limitation for crops.

The seasonal high water table is the main limitation of this soil for community development, especially for homesites and onsite septic systems. Lawns on this soil are soggy in autumn and spring.

The capability subclass is Vs.

SwB—Sutton very stony fine sandy loam, 3 to 8 percent slopes. This soil is gently sloping and moderately well drained. It is near the base of slopes and in slight depressions in glacial till uplands. The areas are mostly oval or irregular in shape and range from 3 to

50 acres. Stones cover 1 to 8 percent of the surface. Slopes are smooth and concave.

Typically, the surface layer is dark brown fine sandy loam 5 inches thick. The subsoil is mottled, yellowish brown fine sandy loam and sandy loam 30 inches thick. The substratum is mottled, light olive brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton, and Paxton soils; moderately well drained Woodbridge soils; and poorly drained Leicester soils. A few areas do not have stones on the surface. Included areas make up about 15 percent of the unit.

This Sutton soil has a seasonal high water table at a depth of about 20 inches from fall to spring. This soil has moderate or moderately rapid permeability. Runoff is medium. The soil has moderate available water capacity and is very strongly acid to medium acid.

This soil is mostly in woodland. A few areas are in pasture or community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stones hinder the use of farming equipment and are difficult to remove. The seasonal high water table, which causes the soil to dry slowly in the spring, is an additional limitation for crops.

The seasonal high water table is the main limitation of this soil for community development, especially for homesites and onsite septic systems. Lawns on this soil are soggy in autumn and spring.

The capability subclass is VIs.

SxB—Sutton extremely stony fine sandy loam, 3 to 8 percent slopes. This soil is gently sloping and moderately well drained. It is at the base of slopes and in slight depressions in glacial till uplands. The areas are mostly oval or irregular in shape and range from 5 to 35 acres. Stones cover 8 to 25 percent of the surface. Slopes are smooth and concave.

Typically, the surface layer is dark brown fine sandy loam 5 inches thick. The subsoil is mottled, yellowish brown fine sandy loam and sandy loam 30 inches thick. The substratum is mottled, light olive brown sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Canton, Charlton, and Paxton soils; moderately well drained Woodbridge soils; and poorly drained Leicester soils. Also included are a few small areas where stones cover less than 8 percent of the surface or where slopes are more than 8 percent. Included areas make up about 15 percent of the unit.

This Sutton soil has a seasonal high water table at a depth of about 20 inches from fall to spring. This soil has moderate or moderately rapid permeability. Runoff is medium. The soil has moderate available water capacity and is very strongly acid to medium acid.

This soil is mostly in woodland. A few areas are in pasture or community development.

This soil generally is too stony for cultivation. The soil is well suited to woodland, but the stones hinder the use of some types of harvesting equipment.

The seasonal high water table is the main limitation of this soil for community development, especially for homesites and onsite septic systems. Lawns on this soil are soggy in autumn and spring.

The capability subclass is VIIs.

Ud—Udorthents, smoothed. This unit consists of nearly level to sloping, excessively drained to moderately well drained soils. The areas of this unit have been altered by excavating or filling. They are mostly irregular in shape or are rectangular or long and narrow, and they generally range from 5 to 60 acres. Slopes range from 0 to 15 percent.

Included with this unit in mapping are small areas of mainly Agawam, Canton, Charlton, Paxton, and Woodbridge soils. Also included are a few small areas covered by buildings and pavement and a few areas that have soil material mixed with logs, tree stumps, and concrete fragments. Included areas make up about 25 percent of the unit.

Determination of the suitability of this unit for any use requires onsite investigation and evaluation.

This unit is not assigned to a capability subclass.

Wd—Walpole sandy loam. This soil is nearly level and poorly drained. It is in depressions and drainageways on stream terraces and outwash plains. The areas are mostly irregular in shape and range from 3 to 15 acres. Slopes range from 0 to 3 percent.

Typically, the surface layer is very dark brown sandy loam 6 inches thick. The subsoil is mottled, dark grayish brown and grayish brown sandy loam and gravelly sandy loam 17 inches thick. The substratum is mottled, light brownish gray gravelly loamy sand and gravelly sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of moderately well drained Ninigret, Pootatuck, and Sudbury soils; poorly drained Rippowam soils; and very poorly drained Scarboro soils. A few large areas have a surface layer of silt loam. Included areas make up about 10 percent of the unit.

This Walpole soil has a seasonal high water table at a depth of about 10 inches during fall and spring. This soil has moderately rapid permeability in the surface layer and subsoil and rapid or very rapid permeability in the substratum. Runoff is slow. The soil has moderate available water capacity and is very strongly acid to medium acid.

This soil is mostly in woodland. Some areas are used for pasture or hay, and a few areas are in community development.

Drained areas of this soil are suited to cultivated crops. Even when drained, however, this soil remains wet for several days after heavy rains, restricting the use of farming equipment. Minimum tillage and cover crops help to maintain tilth in cultivated areas.

The soil is suited to woodland, but seasonal wetness causes a high rate of seedling mortality and restricts the use of some types of harvesting equipment. Uprooting is a hazard during windy periods.

The seasonal high water table is a major limitation of this soil for community development, especially for onsite septic systems. Steep slopes of excavations in this soil are unstable. Lawns on this soil are soggy in fall and spring and after heavy rains.

The capability subclass is IIIw.

WvA—Windsor loamy sand, 0 to 3 percent slopes. This soil is excessively drained and nearly level. It is on glacial outwash plains and terraces. The areas are mostly irregular in shape and range from 5 to 60 acres.

Typically, the surface layer is dark brown loamy sand 7 inches thick. The subsoil is dark yellowish brown and yellowish brown loamy sand 25 inches thick. The substratum is light olive brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Sudbury soils. Included areas make up about 15 percent of the unit.

This Windsor soil has low available water capacity and rapid or very rapid permeability. The water table commonly is at a depth of more than 6 feet. Runoff is slow. This soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

This soil is mostly in woodland. A few areas are used for corn for silage and hay or pasture. Some areas are in community development.

This soil is droughty, but irrigated areas are well suited to cultivated crops. The soil warms early in the spring. Minimum tillage, cover crops, and returning crop residue to the soil help to maintain tilth in cultivated areas.

Droughtiness makes this soil poorly suited to woodland. The rate of seedling mortality is high, and productivity is low.

The rapid permeability in this soil causes a hazard of ground-water pollution in areas used for onsite septic systems. Steep slopes of excavations in this soil are unstable.

The capability subclass is IIIs.

WvB—Windsor loamy sand, 3 to 8 percent slopes. This soil is gently sloping and excessively drained. It is on glacial outwash plains and terraces. The areas are irregular in shape and range from 5 to 80 acres. Slopes are smooth and convex.

Typically, the surface layer is dark brown loamy sand 7 inches thick. The subsoil is dark yellowish brown and yellowish brown loamy sand 25 inches thick. The substratum is light olive brown sand to a depth of 60 inches or more.

Included with this soil in mapping are small areas of excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, and moderately well drained Sudbury soils. Included areas make up about 20 percent of the unit.

This Windsor soil has low available water capacity and rapid or very rapid permeability. The water table commonly is at a depth of more than 6 feet. Runoff is slow. This soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

This soil is mostly in woodland. A few areas are used for corn for silage and hay or pasture. Some areas are in community development.

This soil is droughty, but irrigated areas are well suited to cultivated crops. The soil warms early in the spring. Minimum tillage, cover crops, and returning crop residue to the soil help to maintain tilth in cultivated areas.

Droughtiness makes this soil poorly suited to woodland. The rate of seedling mortality is high, and productivity is low.

The rapid permeability in this soil causes a hazard of ground-water pollution in areas used for onsite septic systems. Steep slopes of excavations in this soil are unstable.

The capability subclass is IIIs.

WxA—Woodbridge fine sandy loam, 0 to 3 percent slopes. This soil is nearly level and moderately well drained. It is on the top and lower side slopes of large drumlins and hills on glacial till uplands. The areas are mostly oval or irregular in shape and range from 3 to 35 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm and very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Leicester and Ridgebury soils. A few small areas have stones on the surface, and a few large areas have a surface layer and subsoil of silt loam. Included areas make up about 10 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. It has moderate available water capacity. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is medium. The soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

Most areas of this soil are used for corn for silage and hay and pasture. A few areas are in fruit orchards or used for vegetables. Some areas are in woodland, and some are in community development.

This soil is well suited to woodland and cultivated crops. The main limitation for crops is the seasonal high water table, which causes the soil to dry slowly in the

spring. Providing drainage helps to dry this soil earlier in the spring, but even drained areas remain wet for several days after heavy rains. Minimum tillage and cover crops help to maintain tilth in cultivated areas.

The water table and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for onsite septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

The capability subclass is IIw.

WxB—Woodbridge fine sandy loam, 3 to 8 percent slopes. This soil is gently sloping and moderately well drained. It is on the tops and lower side slopes of large drumlins and hills on glacial till uplands (fig. 9). The areas are mostly long and narrow and range from 3 to 50 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Leicester and Ridgebury soils. A few small areas have stones on the surface, and a few large areas have a surface layer and subsoil of silt loam. Included areas make up about 15 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. It has moderate available water capacity. The soil has moderate permeability in the surface layer and subsoil

Figure 9.—An area of Woodbridge fine sandy loam, 3 to 8 percent slopes, in the foreground.

and slow to very slow permeability in the substratum. Runoff is medium. The soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

This soil is mostly used for corn for silage and hay and pasture. A few areas are used for fruit orchards or vegetables, a few are in woodland, and some are in community development.

This soil is well suited to woodland and cultivated crops. The main limitation for crops is the seasonal high water table, which causes the soil to dry slowly in the spring. Providing drainage helps to dry the soil earlier in the spring, but even drained areas remain wet for several days after heavy rains. Minimum tillage and cover crops and diversions control runoff and a moderate erosion hazard in cultivated areas.

The water table and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especialy for onsite septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

The capability subclass is IIw.

WxC—Woodbridge fine sandy loam, 8 to 15 percent slopes. This soil is sloping and moderately well drained. It is on side slopes of large drumlins and hills on glacial till uplands. The areas are mostly long and narrow and range from 3 to 25 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. A few small areas have stones on the surface. Included areas make up about 10 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. It has moderate available water capacity. The soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is rapid. This soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

This soil is mostly used for corn for silage and hay and pasture. A few areas are used for fruit orchards or vegetables, a few areas are in woodland, and some are in community development.

This soil is fairly suited to cultivated crops. The slope and wetness are the main limitations. This soil dries out slowly in the spring. Even when drained, it remains wet for several days after heavy summer rains. This soil has a severe erosion hazard. Minimum tillage, cover crops, stripcropping, and using diversions and waterways are suitable management practices to control runoff and erosion.

The seasonal high water table, slope, and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for onsite septic systems. Lawns on this soil are soggy in fall and spring and after heavy rains.

The capability subclass is IIIe.

WyA—Woodbridge very stony fine sandy loam, 0 to 3 percent slopes. This soil is nearly level and moderately well drained. It is on the tops and lower side slopes of large drumlins and hills on glacial till uplands. The areas are mostly oval or irregular in shape and range from 3 to 30 acres. Stones cover 1 to 8 percent of the surface.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Leicester and Ridgebury soils. A few small areas do not have stones on the surface. Included areas make up about 15 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. It has moderate available water capacity. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is slow. The soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

This soil is mostly in woodland. A few areas are in pasture, and a few are in community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stone removal makes the soil well suited to crops but is difficult. Seasonal wetness in fall and spring is an additional limitation for crops.

The water table and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for onsite septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

The capability subclass is Vs.

WyB—Woodbridge very stony fine sandy loam, 3 to 8 percent slopes. This soil is gently sloping and moderately well drained. It is on the tops and side slopes of drumlins and hills on glacial till uplands. The areas are mostly long and narrow or irregular in shape and range from 3 to 25 acres. Stones cover 1 to 8 percent of the surface.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Leicester and Ridgebury soils. A few small areas do not have stones on the surface. Included areas make up about 10 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. The available water capacity is moderate. This soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is medium. The soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slighty acid in the substratum.

Most areas of this soil are in woodland. A few areas are in pasture, and a few are in community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stone removal makes the soil well suited to cultivated crops but is difficult. Seasonal wetness is an additional limitation of the soil for crops.

The water table and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for onsite septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

The capability subclass is VIs.

WyC—Woodbridge very stony fine sandy loam, 8 to 15 percent slopes. This soil is sloping and moderately well drained. It is on side slopes of large drumlins and hills on glacial till uplands. The areas are mostly long and narrow and range from 3 to 25 acres. Stones cover 1 to 8 percent of the surface.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. A few small areas do not have stones on the surface. Included areas make up about 15 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. It has moderate available water capacity. The soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is rapid. The soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

This soil is mostly in woodland. A few areas are in pasture, and a few are in community development.

This soil generally is too stony for cultivation but is well suited to woodland. Seasonal wetness and slope are additional limitations for cultivated crops.

The seasonal high water table, slope, and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for onsite septic systems. Lawns on this soil are soggy in fall and spring and after heavy rains.

The capability subclass is VIs.

WzA—Woodbridge extremely stony fine sandy loam, 0 to 3 percent slopes. This soil is nearly level and moderately well drained. It is on the tops of large drumlins and hills on glacial till uplands. The areas are mostly oval or irregular in shape and range from 5 to 40 acres. Stones cover 8 to 25 percent of the surface.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton soils, and poorly drained Ridgebury soils. Also included are a few small areas where stones cover less than 8 percent of the surface. Included areas make up about 15 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. It has moderate available water capacity. The soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is medium. The soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

This soil is mostly in woodland. A few areas are in pasture, and a few are in community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stone removal makes the soil well suited to crops but is difficult. Seasonal wetness in fall and spring is an additional limitation for crops.

The water table and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for onsite septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

The capability subclass is VIIs.

WzC—Woodbridge extremely stony fine sandy loam, 3 to 15 percent slopes. This soil is gently sloping to sloping and moderately well drained. It is on the tops of large drumlins and hills on glacial till uplands. The areas are mostly oval or irregular in shape and range from 3 to 60 acres. Stones cover 8 to 25 percent of the surface.

Typically, the surface layer is very dark grayish brown fine sandy loam 8 inches thick. The subsoil is mottled, dark yellowish brown and yellowish brown fine sandy loam 22 inches thick. The substratum is firm to very firm, olive gray fine sandy loam and gravelly fine sandy loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Paxton soils, moderately well drained Sutton

soils, and poorly drained Ridgebury soils. Included areas make up about 15 percent of the unit.

This Woodbridge soil has a seasonal high water table at a depth of about 20 inches from fall to spring. It has moderate available water capacity. The soil has moderate permeability in the surface layer and subsoil and slow to very slow permeability in the substratum. Runoff is rapid. This soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

This soil is mostly in woodland. A few areas are in pasture, and a few are in community development.

This soil generally is too stony for cultivation but is well suited to woodland. Stone removal makes the soil well suited to crops but is difficult. Seasonal wetness in fall and spring is an additional limitation for crops.

The water table and the slow or very slow permeability in the substratum are the main limitations of this soil for community development, especially for onsite septic systems. Lawns on this soil are soggy in the autumn and spring and after heavy rains.

The capability subclass is VIIs.

prime farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in providing the Nation's short- and long-range needs for food and fiber. The supply of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, must encourage and facilitate the use of our Nation's prime farmland with wisdom and foresight.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops when it is treated and managed using acceptable farming methods. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland may now be in crops, pasture, woodland, or other land, but not urban and built-up land or water areas. It must either be used for producing food or fiber or be available for these uses.

Prime farmland usually has an adequate and dependable supply of moisture from precipitation. It also has favorable temperature and growing season and acceptable acidity or alkalinity. It has few or no rocks and is permeable to water and air. Prime farmland is not excessively erodible or saturated with water for long periods and is not flooded during the growing season. The slope ranges mainly from 0 to 8 percent. About 45,000 acres, or nearly 14 percent, of Windham County meets the soil requirements for prime farmland. The areas are scattered throughout the county. For more detailed information on the criteria for prime farmland, consult the local staff of the Soil Conservation Service.

A recent trend in land use in some parts of the county has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and difficult to cultivate and are usually less productive.

Soil map units that make up prime farmland in Windham County are listed in this section. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps in the back of this publication. The soil qualities that affect use and management are described in the section "Detailed soil map units."

The map units that meet the soil requirements for prime farmland are:

AfA—Agawam fine sandy loam, 0 to 3 percent slopes
AfB—Agawam fine sandy loam, 3 to 8 percent slopes
CbD—Canton and Charlton fine sandy loams, 3 to 8 percent slopes
MyA—Merrimac sandy loam, 0 to 3 percent slopes
MyB—Merrimac sandy loam, 3 to 8 percent slopes
Nn—Ninigret fine sandy loam
On—Occum fine sandy loam
PbB—Paxton fine sandy loam, 3 to 8 percent slopes
Ps—Pootatuck fine sandy loam
Sg—Sudbury sandy loam
SvA—Sutton fine sandy loam, 0 to 3 percent slopes
SvB—Sutton fine sandy loam, 3 to 8 percent slopes
WxA—Woodbridge fine sandy loam, 0 to 3 percent slopes
WxB—Woodbridge fine sandy loam, 3 to 8 percent slopes

use and management of the soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

crops and pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed soil map units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

The major crops in Windham County, grown mainly to support dairy farming, are corn for silage and hay. The common hay crops are alfalfa, timothy, red clover, and ladino clover. Vegetables, apples, nursery stock, and grapes are the other commonly produced crops. The common vegetables are sweet corn, tomatoes, squash, beans, peppers, cucumbers, and lettuce.

The major concerns in management are erosion, drainage, fertility, and stoniness. All soils in the county need lime and fertilizer for good crop production, and most of the soils respond well to lime and fertilizer. Most soils are easy to maintain in good tilth.

The practices that help control runoff and erosion are growing cover crops, using grassed waterways and diversions, using minimum tillage, and stripcropping in some areas (fig. 10). Open ditches and tile are used to drain wet soils.

yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green-manure crops; and harvesting that insures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed.

The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils.

land capability classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit (*5*). Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Figure 10.—A grassed waterway on an area of Woodbridge fine sandy loam, 3 to 8 percent slopes.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 or IIIe-6.

The acreage of soils in each capability class and subclass is shown in table 6. The capability classification of each map unit is given in the section "Detailed soil map units."

woodland management and productivity

Stephen H. Broderick, extension forestry agent, University of Connecticut, assisted with the preparation of this section.

Commercial forestland occupies about 66 percent of Windham County; approximately 93 percent of the forestland is privately owned.

The majority of the commercial forestland is in two tree associations. The oak-hickory association accounts for 42 percent of the commercial forestland; the elm-ash-red maple association occupies 21 percent. The other main associations are maple-beech-birch, oak-pine, white pine and red pine-hemlock, pitch pine-eastern redcedar, spruce-fir, and aspen-birch. Major products derived from forestland are sawlogs for lumber and fuelwood.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: x, w, t, d, c, s, f, and r.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that a few trees may be blown down by normal winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

recreation

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking, horseback riding, and bicycling should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

wildlife habitat

Soils affect the kind and amount of vegetation that is available to wildlife for food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that

limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn and wheat.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, and wheatgrass.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse, seeds, and cones. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, shore birds, muskrat, mink, and beaver.

engineering

Whitney T. Ferguson, Jr., state conservation engineer, Soil Conservation Service, Storrs, Connecticut, assisted with the preparation of this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this

section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

building site development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock, or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock, or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock, or to a cemented pan, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

sanitary facilities

Table 11 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the

indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 11 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to effectively filter the effluent. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, and soil reaction affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

construction materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil

properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

water management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders and organic matter. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

soil properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed (*4*). During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

engineering index properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and their morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains particles coarser than sand, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as Pt. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent.

Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

physical and chemical properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 15, the estimated content of organic matter of the plow layer is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity,

infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

soil and water features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt and water in swamps and marshes are not considered flooding.

Table 16 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 16.

An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An artesian water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured clayey

soils that have a high water table in winter are most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*6*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 17, the soils of the survey area are classified according to the system. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Inceptisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Ochrept (*Ochr*, meaning pale, plus *ept*, from Inceptisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Dystrochrepts (*Dystr*, meaning low base saturation or infertile, plus *ochrept*, the suborder of the Inceptisols that have an ochric epipedon).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Dystrochrepts.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is coarse-loamy, mixed, mesic Typic Dystrochrepts.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

soil series and their morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (*4*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*6*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed soil map units."

Adrian series

The Adrian series consists of very poorly drained soils formed in herbaceous organic deposits 16 to 50 inches deep. Adrian soils are on outwash plains and terraces in depressions and basins. Slopes range from 0 to 2 percent.

Adrian soils are on the landscape with poorly drained Leicester and Ridgebury soils and very poorly drained Carlisle, Palms, Saco, Scarboro, and Whitman soils. Adrian soils formed in a thicker organic layer than Saco, Scarboro, or Whitman soils and in a thinner layer than Carlisle soils. Adrian soils have more sand in the substratum than Palms soils.

Typical pedon of Adrian muck, in the town of Thompson, 0.2 mile west of the Massachusetts state line along Rocky Brook, and 100 feet south of East Thompson Road:

Oa1—0 to 4 inches, black (N 2/0) muck (sapric material), black (10YR 2/1) rubbed; 20 percent fiber, 5 percent rubbed; weak coarse granular structure; friable; herbaceous fibers; strongly acid; clear smooth boundary.
Oa2—4 to 12 inches, very dark gray (10YR 3/1) muck (sapric material), very dark brown (10YR 2/2) rubbed; 15 percent fiber, 5 percent rubbed; weak coarse subangular blocky structure; friable; herbaceous fibers; strongly acid; gradual smooth boundary.
Oa3—12 to 33 inches, black (10YR 2/1) muck (sapric material), very dark brown (10YR 2/2) rubbed; 5 percent fiber, 2 percent rubbed; massive; strongly acid; clear wavy boundary.
IIC—33 to 60 inches, gray (10YR 5/1) gravelly sand; dark grayish brown (10YR 4/2) stains; massive; 30 percent coarse fragments; medium acid.

The organic layer is 16 to 50 inches thick. Fragments, ranging from 1/8 inch to 6 inches in diameter, of twigs, branches, and logs make up 5 to 15 percent of the organic layer. Coarse fragments make up 5 to 35 percent of the IIC horizon. The organic layer is strongly acid to medium acid, and the sandy substratum is medium acid to slightly acid.

The surface and subsurface tiers have neutral colors or hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 0 through 3. Broken face, rubbed, and pressed colors differ by 1 or 2 units in value and chroma in most pedons. The organic material is primarily sapric but has thin layers of hemic material in some pedons. The mineral material makes up as much as 50 percent of some pedons.

The IIC horizon has hue of l0YR to 5Y, value of 4 or 5, and chroma of 1 or 2. It is loamy sand, sand, or their gravelly analogues.

Agawam series

The Agawam series consists of well drained soils that formed in sand and gravel derived mainly from schist and gneiss. Agawam soils are on outwash plains and stream terraces. Slopes range from 0 to 8 percent.

Agawam soils are on the landscape with excessively drained Hinckley and Windsor soils, somewhat excessively drained Merrimac soils, moderately well drained Ninigret and Sudbury soils, and poorly drained Walpole soils.

Typical pedon of Agawam fine sandy loam, 3 to 8 percent slopes, in the town of Woodstock, 0.25 mile east of the center of East Woodstock along Connecticut Route 93 and 0.25 mile west of the intersection of Dugg Hill Road and Hibbard Road:

Ap—0 to 10 inches, dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; slightly acid; abrupt smooth boundary.
B21—10 to 18 inches, yellowish brown (10YR 5/6) fine sandy loam; weak medium granular structure; very friable; common fine and few medium roots; slightly acid; clear wavy boundary.
B22—18 to 28 inches, yellowish brown (10YR 5/4) fine sandy loam; massive; very friable; few fine and medium roots; medium acid; clear wavy boundary.
B23—28 to 30 inches, strong brown (7.5YR 5/6) fine sandy loam; massive; very friable; few fine roots; medium acid; abrupt wavy boundary.
IIC1—30 to 40 inches, very pale brown (10YR 7/3) fine sand; single grain; loose; slightly acid; gradual wavy boundary.
IIC2—40 to 60 inches, very pale brown (10YR 7/3) sand; single grain; loose; 5 percent coarse fragments; slightly acid.

The solum is 15 to 35 inches thick. Coarse fragments make up 0 to 10 percent of the surface layer, 0 to 30 percent of the B and part of the C horizon above a depth of 40 inches, and 0 to 60 percent of the part of the C horizon below a depth of 40 inches. The soil is strongly acid to slightly acid.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 through 4. Some pedons have an A1 horizon with hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 through 3.

The B horizon has hue of 7.5YR to 2.5Y, value of 4 through 7, and chroma of 3 through 7. It is very fine sandy loam or fine sandy loam in the upper part and fine sandy loam in the lower part.

The IIC horizon has hue of 10YR to 5Y, value of 3 through 7, and chroma of 1 through 4. It is loamy fine sand through gravelly coarse sand above a depth of 40 inches and loamy fine sand through very gravelly coarse sand below a depth of 40 inches.

Brimfield series

The Brimfield series consists of somewhat excessively drained, very stony soils that formed in glacial till derived mainly from micaceous schist and gneiss. Brimfield soils are on ridgetops and side slopes of glacial till uplands. Slopes range from 3 to 35 percent.

Brimfield soils are on the landscape with somewhat excessively drained Hollis soils; well drained Brookfield, Canton, Charlton, and Paxton soils; and moderately well drained Woodbridge soils. Brimfield soils have a redder hue than Hollis soils.

Typical pedon of Brimfield fine sandy loam, in an area of Brookfield-Brimfield fine sandy loams, very rocky, 3 to 15 percent slopes, in the town of Woodstock, 0.75 mile south of the Massachusetts State line on the west side of Route 198, in a wooded area:

O2—2 inches to 0, decomposed and partly decomposed leaf litter and twigs.
A1—0 to 1 inch, dark brown (7.5YR 3/2) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; 15 percent rock fragments; strongly acid; abrupt smooth boundary.
B21—1 to 5 inches, reddish brown (5YR 4/4) gravelly fine sandy loam; weak medium subangular blocky structure; friable; many fine roots; 20 percent rock fragments; strongly acid; clear wavy boundary.
B22—5 to 12 inches, yellowish red (5YR 4/6) gravelly fine sandy loam; weak medium subangular blocky structure; friable; many fine roots; 30 percent rock fragments; medium acid; clear wavy boundary.
B23—12 to 18 inches, yellowish red (5YR 5/6) gravelly fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; 30 percent rock fragments; medium acid; clear wavy boundary.
R—18 inches, hard unweathered schist bedrock.

The solum thickness and depth to bedrock are 10 to 20 inches. Rock fragments make up 5 to 35 percent of the soil. The soil is very strongly acid to medium acid.

The A horizon has hue of 5YR through 10YR, value of 2 or 3, and chroma of 1 through 3. It is dominantly fine sandy loam but includes sandy loam.

The B horizon has hue of 2.5YR through 7.5YR, value of 3 through 6, and chroma of 4 through 8. Hue of 7.5YR is limited to the subhorizons. The B horizon is fine sandy loam, sandy loam, or loam.

The underlying bedrock is hard, unweathered schist.

Brookfield series

The Brookfield series consists of well drained, very stony soils formed in loamy glacial till derived from micaceous schist and gneiss. Brookfield soils are on ridgetops and side slopes of glacial till uplands. Slopes range from 3 to 35 percent.

Brookfield soils are on the landscape with somewhat excessively drained Brimfield and Hollis soils; well drained Canton, Charlton, and Paxton soils; and moderately well drained Woodbridge soils. Brookfield soils have a redder hue in the B horizon than Canton and Charlton soils and a more friable C horizon than Paxton soils.

Typical pedon of Brookfield fine sandy loam, in an area of Brookfield-Brimfield fine sandy loams, very rocky, 3 to 15 percent slopes, in the town of Woodstock, 0.5 mile south of the Massachusetts State line on the west side of Route 198, in a wooded area:

O1—3 inches to 1 inch, pine needles, leaves, and twigs.
O2—1 inch to 0, decomposed leaves; root mat.
A1—0 to 1 inch, dark brown (7.5YR 3/2) fine sandy loam; weak medium granular structure; friable; many fine roots; 5 percent rock fragments; strongly acid; abrupt smooth boundary.
B21—1 to 6 inches, dark reddish brown (5YR 3/4) fine sandy loam; weak medium subangular blocky structure; friable; many fine roots; 10 percent rock fragments; strongly acid; abrupt smooth boundary.
B22—6 to 13 inches, yellowish red (5YR 4/6) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; 10 percent rock fragments; strongly acid; clear wavy boundary.
B23—13 to 29 inches, strong brown (7.5YR 5/6) gravelly fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; 20 percent rock fragments; strongly acid; clear wavy boundary.
C—29 to 60 inches, yellowish brown (10YR 5/4) gravelly fine sandy loam; massive; friable; few fine roots; 30 percent rock fragments; strongly acid; clear wavy boundary.

The solum is 20 to 34 inches thick. Rock fragments make up 5 to 30 percent of the solum and 15 to 35 percent of the substratum. The soil is very strongly acid to medium acid.

The A horizon has hue of 7.5YR or 10YR, value of 2 through 4, and chroma of 2 through 4. It is dominantly fine sandy loam but ranges to include loam.

The upper part of the B horizon has hue of 2.5YR through 7.5YR, value of 3 through 6, and chroma of 4 through 8; the lower part has hue of 5YR through 10YR, value of 4 or 5, and chroma of 4 through 8. The B horizon is fine sandy loam, loam, sandy loam, or their gravelly analogues.

The C horizon has hue of 7.5YR through 2.5Y, value of 5 or 6, and chroma of 2 through 6. It is fine sandy loam, sandy loam, or their gravelly analogues.

Canton series

The Canton series consists of well drained, nonstony to extremely stony soils that formed in sandy glacial till derived mainly from schist and gneiss. Canton soils are on hills, ridges, and steep side slopes of glacial till uplands. Slopes range from 3 to 35 percent.

Canton soils are on the landscape with excessively drained Gloucester and Hollis soils, well drained Charlton soils, and moderately well drained Sutton soils. Canton soils have more sand in the substratum than Charlton soils.

Typical pedon of Canton fine sandy loam, in an area of Canton and Charlton very stony fine sandy loams, 3 to 8 percent slopes, in the town of Killingly, 0.25 mile east of Ross Road and 330 feet south of the Connecticut Turnpike:

O2—1 inch to 0, decomposed and partially decomposed deciduous litter.
A1—0 to 2 inches, very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; 5 percent rock fragments; very strongly acid; abrupt smooth boundary.

B21—2 to 12 inches, yellowish brown (10YR 5/8) fine sandy loam; weak medium subangular blocky structure; friable; many fine and medium roots; 10 percent rock fragments; very strongly acid; gradual wavy boundary.
B22—12 to 19 inches, yellowish brown (10YR 5/6) gravelly fine sandy loam; weak medium subangular blocky structure; very friable; common fine and few medium roots; 20 percent rock fragments; very strongly acid; gradual wavy boundary.
B23—19 to 23 inches, yellowish brown (10YR 5/6) gravelly sandy loam; massive; very friable; few fine roots; 30 percent rock fragments; very strongly acid; gradual wavy boundary.
IIC1—23 to 36 inches, pale brown (10YR 6/3) gravelly loamy sand; single grain; loose; 35 percent rock fragments; strongly acid; gradual wavy boundary.
IIC2—36 to 60 inches, pale brown (10YR 6/3) gravelly loamy sand; single grain; loose, 45 percent rock fragments; strongly acid.

The solum is 18 to 36 inches thick. Rock fragments make up 5 to 30 percent of the solum and 15 to 50 percent of the C horizon. The soil is very strongly acid to medium acid.

The A horizon has hue of 10YR, value of 2 through 4, and chroma of 1 or 2. It is mostly fine sandy loam or very fine sandy loam.

The upper part of the B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 8. The lower part has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 4 through 8. The B horizon is dominantly fine sandy loam, but some pedons have up to 5 inches of sandy loam or gravelly sandy loam in the lower part. The horizon has weak granular or subangular blocky structure, or it is massive. The horizon is very friable or friable.

The IIC horizon has hue of 10YR or 2.5Y, value of 5 through 7, and chroma of 2 or 3. It is dominantly gravelly loamy sand but ranges from loamy fine sand to gravelly loamy coarse sand. It is massive or single grain and very friable or loose.

Carlisle series

The Carlisle series consists of nearly level, very poorly drained soils formed in organic deposits more than 51 inches thick. Carlisle soils are in bogs, depressions, and basins on outwash plains, stream terraces, and glacial till plains. Slopes range from 0 to 2 percent.

Carlisle soils are on the landscape with poorly drained Leicester and Ridgebury soils and very poorly drained Adrian, Palms, Saco, Scarboro, and Whitman soils. Carlisle soils formed in a thicker organic layer than the Adrian, Palms, Saco, Scarboro, or Whitman soils.

Typical pedon of Carlisle muck, in the town of Plainfield, 300 feet east of Green Hollow Road and 100 feet south of Moosup Pond Road:

Oa1—0 to 8 inches, black (N 2/0) muck (sapric material) broken face, black (10YR 2/1) rubbed; 5 percent fiber; weak medium granular structure; friable; many fine roots; herbaceous fibers; 22 percent organic matter; medium acid; clear smooth boundary.
Oa2—8 to 12 inches, very dark brown (10YR 2/2) muck (sapric material) broken face and rubbed; 5 percent fiber; weak medium granular structure; friable; few fine roots; herbaceous fibers; 77 percent organic matter; medium acid; clear smooth boundary.
Oa3—12 to 16 inches black (N 2/0) muck (sapric material) broken face, black (10YR 2/1) rubbed; 20 percent fiber, 5 percent rubbed; massive; friable; herbaceous fibers; 89 percent organic matter; medium acid; gradual wavy boundary.
Oa4—16 to 29 inches, black (5YR 2/1) muck (sapric material) broken face, dark reddish brown (5YR 2/2) rubbed; 65 percent fiber, 10 percent rubbed; massive; friable; herbaceous fibers; 80 percent organic matter; medium acid; gradual wavy boundary.
Oa5—29 to 37 inches, black (10YR 2/1) muck (sapric material) broken face, black (N 2/0) rubbed; 5 percent fiber; massive; friable; herbaceous fibers; 84 percent organic matter; medium acid; gradual wavy boundary.
Oa6—37 to 48 inches, black (10YR 2/1) muck (sapric material) broken face, black (N 2/0) rubbed; 65 percent fiber, 20 percent rubbed; massive; friable; woody fibers; 93 percent organic matter; medium acid; gradual wavy boundary.
Oa7—48 to 60 inches, dark reddish brown (5YR 2/2) muck (sapric material) broken face and rubbed; 35 percent fiber, 5 percent rubbed; massive; friable; woody fibers; 90 percent organic matter; medium acid.

The organic layer is more than 51 inches thick. Woody fragments of twigs, branches, and logs from 1/4 inch to more than 1 foot in diameter make up to 20 percent of some pedons. The soil is very strongly acid to slightly acid.

The surface tier has neutral colors or has hue of 10YR, value of 2, and chroma of 0 through 2. Some pedons are up to 15 percent hemic material.

The subsurface tier has neutral colors or has hue of 5YR through 10YR, value of 2 or 3, and chroma of 0 through 3. The organic material is dominantly sapric material, but some pedons are up to 10 percent hemic material.

The bottom tier has neutral colors or it has hue of 5YR through 10YR, value of 2 or 3, and chroma of 0 through 3. Some pedons have hemic material up to 10 inches thick.

Charlton series

The Charlton series consists of well drained, nonstony to extremely stony soils formed in loamy glacial till

derived mainly from schist and gneiss. Charlton soils are on hills, ridges, and steep side slopes of glacial till uplands. Slopes range from 3 to 35 percent.

Charlton soils are on the landscape with somewhat excessively drained Gloucester and Hollis soils, well drained Canton soils, and moderately well drained Sutton soils. Charlton soils have more silt and clay in the substratum than Canton soils.

Typical pedon of Charlton fine sandy loam, in an area of Canton and Charlton very stony fine sandy loams, 3 to 8 percent slopes, in the town of Killingly, 100 feet west of Route 52 along Fall Brook Road, in a wooded area:

O2—2 inches to 0, decomposed and partially decomposed leaf litter.
Ap—0 to 5 inches, dark yellowish brown (10YR 4/4) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; 10 percent rock fragments; very strongly acid; abrupt smooth boundary.
B21—5 to 9 inches, yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; 10 percent rock fragments; very strongly acid; gradual wavy boundary.
B22—9 to 20 inches, yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; 15 percent rock fragments; very strongly acid; gradual wavy boundary.
B23—20 to 25 inches, yellowish brown (10YR 5/4) sandy loam; weak medium subangular blocky structure; friable; few fine roots; 10 percent rock fragments; very strongly acid; gradual wavy boundary.
C1—25 to 32 inches, light yellowish brown (2.5Y 6/4) sandy loam; massive; friable; 10 percent rock fragments; very strongly acid; gradual wavy boundary.
C2—32 to 60 inches, light brownish gray (2.5Y 6/2) sandy loam; massive; friable; 10 percent rock fragments; very strongly acid.

The solum is 20 to 36 inches thick. Rock fragments make up 5 to 35 percent of the soil. The soil is very strongly acid to medium acid.

The A horizon has hue of 10YR, value of 2 through 4, and chroma of 2 through 4. It is fine sandy loam or sandy loam.

The upper part of the B horizon has hue of 7.5YR or 10YR and value and chroma of 4 through 6. The lower part has hue of 10YR or 2.5Y and value and chroma of 4 through 6. The B horizon is dominantly fine sandy loam but ranges from sandy loam to loam or their gravelly analogues. The horizon has weak granular or weak subangular blocky structure, or it is massive. Consistence is very friable or friable.

The C horizon has hue of 2.5Y or 5Y, value of 4 through 6, and chroma of 2 through 4. It is fine sandy loam, sandy loam, loam, or their gravelly analogues. Many pedons have thin lenses or pockets of sand and loamy sand. Consistence is very friable or friable.

Gloucester series

The Gloucester series consists of somewhat excessively drained, very stony to extremely stony soils formed in sandy glacial till derived mainly from schist and gneiss. Gloucester soils are on small, irregularly shaped hills and ridges mostly adjacent to stream terraces throughout the survey area. Slopes range from 3 to 35 percent.

Gloucester soils are on the landscape with excessively drained Hinckley soils; somewhat excessively drained Merrimac soils; well drained Canton, Charlton, and Paxton soils; and moderately well drained Sutton and Woodbridge soils. Gloucester soils have more rock fragments in the control section than Merrimac soils.

Typical pedon of Gloucester sandy loam, in an area of Gloucester very stony sandy loam, 3 to 8 percent slopes, in the town of Sterling, 1/2 mile south of Quaduck Brook and 1/4 mile east of Gibson Hill Road, in a wooded area:

A1—0 to 4 inches, very dark grayish brown (10YR 3/2) sandy loam; weak fine granular structure; very friable; many fine and medium roots; 10 percent rock fragments; strongly acid; abrupt smooth boundary.
B21—4 to 12 inches, dark yellowish brown (10YR 4/6) gravelly sandy loam; weak medium granular structure; very friable; common fine and medium roots; 20 percent rock fragments; strongly acid; clear wavy boundary.
B22—12 to 25 inches, yellowish brown (10YR 5/6) gravelly loamy sand; weak medium granular structure; very friable; few fine and medium roots; 35 percent rock fragments; strongly acid; clear wavy boundary.
C1—25 to 35 inches, light olive brown (2.5Y 5/4) gravelly loamy coarse sand; single grain; loose; few medium roots; 35 percent rock fragments; strongly acid; gradual wavy boundary.
C2—35 to 60 inches, light brownish gray (2.5Y 6/2) gravelly loamy coarse sand; single grain; loose; 50 percent rock fragments; strongly acid.

The solum is 20 to 36 inches thick. Rock fragments make up 5 to 35 percent of the A horizon, 20 to 60 percent of the B horizon above a depth of 18 inches, and 35 to 80 percent of the B horizon below a depth of 18 inches. The soil is very strongly acid to medium acid.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 through 3. It is fine sandy loam, sandy loam, coarse sandy loam, or their gravelly analogues.

The upper part of the B horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 3 through 8. The

lower part of the B horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 3 through 6. The upper part is fine sandy loam, sandy loam, coarse sandy loam, or their gravelly analogues. The lower part is gravelly or very gravelly sandy loam, loamy fine sand, loamy sand, or loamy coarse sand. The horizon has weak medium granular or subangular blocky structure, or it is massive. Consistence is friable or very friable.

The C horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 2 through 4. It is loamy fine sand, loamy sand, loamy coarse sand, or their gravelly or very gravelly analogues.

Hinckley series

The Hinckley series consists of excessively drained soils formed in water-sorted sand and gravel deposits derived mainly from gneiss and schist. Hinckley soils are on outwash plains and stream terraces. Slopes range from 0 to 40 percent.

Hinckley soils are on the landscape with excessively drained Windsor soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, moderately well drained Sudbury soils, and poorly drained Walpole soils. Hinckley soils have more coarse fragments than Windsor soils.

Typical pedon of Hinckley gravelly sandy loam, 15 to 40 percent slopes, in the town of Putnam, 100 feet north of the intersection of Chase Road and Cady Road in the side of a gravel pit:

O2—2 inches to 0, decomposed and partially decomposed leaf litter and root mat.
A1—0 to 2 inches, very dark grayish brown (10YR 3/2) gravelly sandy loam; weak fine granular structure; very friable; common fine roots; 30 percent coarse fragments; strongly acid; clear wavy boundary.
B21—2 to 4 inches, dark yellowish brown (10YR 4/4) gravelly sandy loam; weak medium granular structure; very friable; common fine roots; 30 percent coarse fragments; medium acid; clear wavy boundary.
B22—4 to 8 inches, yellowish brown (10YR 5/6) gravelly sandy loam; weak medium granular structure; very friable; common fine roots; 30 percent coarse fragments; medium acid; gradual wavy boundary.
B23—8 to 15 inches, yellowish brown (10YR 5/8) gravelly loamy sand; single grain; loose; few fine roots; 30 percent coarse fragments; medium acid; gradual wavy boundary.
B3—15 to 18 inches, brownish yellow (10YR 6/6) gravelly loamy sand; single grain; loose; few fine roots; 40 percent coarse fragments; medium acid; gradual wavy boundary.
IIC—18 to 60 inches, pale yellow (2.5Y 7/4) gravelly sand; single grain; loose; 60 percent coarse fragments; medium acid.

The solum is 12 to 30 inches thick. Coarse fragments make up 10 to 50 percent of the solum and 35 to 70 percent of the substratum. The soil is extremely acid to medium acid.

The A horizon has hue of 10YR, value of 2 through 4, and chroma of 1 through 3. It is dominantly gravelly sandy loam but ranges to gravelly loamy coarse sand.

The upper part of the B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 8. The lower part of the B horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 4 through 8. The B horizon is dominantly gravelly sandy loam but ranges from gravelly loamy fine sand to very gravelly loamy coarse sand.

The IIC horizon has hue of 7.5YR through 2.5Y, value of 5 through 7, and chroma of 2 through 8. It is gravelly loamy fine sand through very gravelly loamy coarse sand and is commonly stratified.

Hollis series

The Hollis series consists of somewhat excessively drained, very stony to extremely stony soils formed in a mantle of loamy glacial till derived mainly from schist and gneiss. Hollis soils are on ridgetops and side slopes of glacial till uplands. Slopes range from 3 to 35 percent.

Hollis soils are on the landscape with excessively drained Hinckley soils; somewhat excessively drained Brimfield soils; and well drained Canton, Charlton, and Paxton soils. The Hollis soils have a yellower hue in the B horizon than the Brimfield soils.

Typical pedon of Hollis fine sandy loam, in an area of Charlton-Hollis fine sandy loams, very rocky, 3 to 15 percent slopes, in the town of Eastford, 300 feet east of Frog Rock Park and 75 feet north of Route 44, in a wooded area:

O2—2 inches to 0, decomposed and partially decomposed deciduous leaf litter.
A1—0 to 2 inches, dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure; very friable; many roots; very strongly acid; abrupt wavy boundary.
B21—2 to 11 inches, yellowish brown (10YR 5/6) gravelly fine sandy loam; weak medium subangular blocky structure; very friable; many roots; 25 percent rock fragments; very strongly acid; gradual wavy boundary.
B22—11 to 14 inches, yellowish brown (10YR 5/6) gravelly fine sandy loam; weak medium subangular blocky structure; very friable; many roots; 25 percent rock fragments; strongly acid; abrupt smooth boundary.
R—14 inches, hard unweathered schist bedrock.

The solum thickness and depth to bedrock are 10 to 20 inches. Rock fragments make up 2 to 25 percent of the soil. This soil is very strongly acid to medium acid.

The A horizon has hue of 10YR, value of 2 through 4, and chroma of 2 or 3. It is fine sandy loam, loam, or sandy loam, and it is friable or very friable.

The B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 8. It is fine sandy loam, loam, sandy loam, or their gravelly analogues. The horizon is massive, or it has weak granular or subangular blocky structure. Consistence is very friable or friable.

The underlying bedrock is hard, unweathered schist or gneiss.

Leicester series

The Leicester series consists of poorly drained, extremely stony soils that formed in loamy glacial till derived mainly from schist and gneiss. Leicester soils are in depressions and small drainageways of glacial till uplands. Slopes range from 0 to 3 percent.

Leicester soils are on the landscape with well drained Canton, Charlton, and Paxton soils; moderately well drained Sutton and Woodbridge soils; poorly drained Ridgebury soils; and very poorly drained Whitman soils. Leicester soils have a more friable C horizon than Ridgebury soils.

Typical pedon of Leicester fine sandy loam, in an area of Ridgebury, Leicester, and Whitman extremely stony fine sandy loams, in the town of Killingly, 200 feet east of the intersection of Cook Hill Road and Cranberry Bog Road:

A1—0 to 7 inches, very dark brown (10YR 2/2) fine sandy loam; weak medium granular structure; friable; many fine and medium roots; 15 percent rock fragments; very strongly acid; abrupt smooth boundary.

B21—7 to 17 inches, grayish brown (10YR 5/2) fine sandy loam; common medium distinct yellowish red (5YR 4/6) and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; 15 percent rock fragments; strongly acid; gradual smooth boundary.

B22—17 to 25 inches, grayish brown (10YR 5/2) fine sandy loam; common fine distinct yellowish red (5YR 5/6) mottles and common medium distinct dark grayish brown (10YR 4/2) mottles; weak medium subangular blocky structure; friable; few fine roots; 15 percent rock fragments; strongly acid; gradual wavy boundary.

B23—25 to 30 inches, light olive brown (2.5Y 5/4) fine sandy loam; few fine distinct yellowish red (5YR 5/6) mottles and common fine distinct reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure; friable; 10 percent rock fragments; strongly acid; gradual wavy boundary.

C1—30 to 38 inches, light olive brown (2.5Y 5/4) sandy loam; few fine faint light brownish gray (10YR 6/2) mottles and common fine distinct dark brown (7.5YR 4/4) mottles; massive; friable; 10 percent rock fragments; strongly acid; gradual smooth boundary.

C2g—38 to 60 inches, grayish brown (2.5Y 5/2) sandy loam; few fine distinct dark brown (7.5YR 4/4) mottles; massive; friable; 10 percent rock fragments; medium acid.

The solum is 20 to 36 inches thick. Rock fragments make up 5 to 35 percent of the soil. The soil is very strongly acid to medium acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is dominantly fine sandy loam but ranges to include sandy loam. Consistence is very friable or friable.

The B horizon has hue of 10YR through 5Y and value of 4 through 6. The upper part has chroma of 1 or 2, and the lower part has chroma of 1 through 4. The B horizon is fine sandy loam, sandy loam, or their gravelly analogues. The horizon has weak granular or subangular blocky structure, or it is massive.

The C horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 1 through 4. It has prominent or distinct mottles that commonly become less abundant with depth. The C horizon is fine sandy loam, sandy loam, or their gravelly analogues. It is very friable or friable and has firm lenses or pockets in many pedons.

Merrimac series

The Merrimac series consists of somewhat excessively drained soils that formed in water-sorted sand and gravel deposits derived mainly from schist and gneiss. Merrimac soils are on outwash plains and stream terraces. Slopes range from 0 to 8 percent.

Merrimac soils are on the landscape with excessively drained Hinckley and Windsor soils, well drained Agawam soils, moderately well drained Sudbury soils, poorly drained Walpole soils, and very poorly drained Scarboro soils.

Typical pedon of Merrimac sandy loam, 0 to 3 percent slopes, in the town of Killingly, 1.25 miles west of Connecticut Route 52 and 200 feet north of Lake Road, in a field next to a gravel pit near Alexander's Lake:

Ap—0 to 8 inches, dark brown (10YR 3/3) sandy loam; weak medium granular structure; very friable; common roots; strongly acid; abrupt smooth boundary.

B21—8 to 20 inches, yellowish brown (10YR 5/8) sandy loam; weak medium granular structure; very friable; common roots; strongly acid; gradual wavy boundary.

B22—20 to 24 inches, yellowish brown (10YR 5/6) loamy sand; weak medium granular structure; very friable; few roots; 10 percent coarse fragments; strongly acid; gradual wavy boundary.

IIC1—24 to 27 inches, yellowish brown (10YR 5/6) gravelly sand; single grain; loose; 50 percent coarse fragments; strongly acid; gradual smooth boundary.

IIC2—27 to 60 inches, yellowish brown (10YR 5/6) stratified sand and gravel; single grain; loose; 50 percent coarse fragments; strongly acid.

The solum is 18 to 30 inches thick. Coarse fragments make up 5 to 30 percent of the solum and 30 to 55 percent of the substratum. The soil is extremely acid to medium acid.

The A horizon has hue of 7.5YR or 10YR, value of 2 through 4, and chroma of 1 through 4. It is fine sandy loam or sandy loam.

The upper part of the B horizon has hue of 7.5YR or 10YR, value of 3 through 6, and chroma of 3 through 8; the lower part has hue of 7.5YR through 2.5Y, value of 3 through 6, and chroma of 3 through 8. The upper part of the B horizon is fine sandy loam or sandy loam, and the lower part is sandy loam, loamy sand, or their gravelly analogues. The sandy loam does not extend below a depth of 27 inches. The B horizon has weak granular structure, or it is massive.

The IIC horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 3 through 8. It is gravelly or very gravelly sand or stratified sand and gravel.

Ninigret series

The Ninigret series consists of moderately well drained soils that formed in a loamy mantle over sand and gravel derived mainly from gneiss and schist. Ninigret soils are on glacial outwash plains and stream terraces. Slopes range from 0 to 5 percent.

Ninigret soils are on the landscape with excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Agawam and Occum soils, moderately well drained Sudbury soils, and poorly drained Walpole soils. Ninigret soils have a finer textured solum than Sudbury soils.

Typical pedon of Ninigret fine sandy loam, in the town of Brooklyn, 1/2 mile east of Connecticut Route 169 and 1/4 mile north of the Canterbury town line, in a cultivated field:

Ap—0 to 8 inches, very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; friable; many fine roots; medium acid; abrupt smooth boundary.

B21—8 to 13 inches, yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; medium acid; gradual wavy boundary.

B22—13 to 16 inches, yellowish brown (10YR 5/6) fine sandy loam; common medium distinct brown (10YR 5/3) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; medium acid; clear wavy boundary.

B23—16 to 22 inches, light olive brown (2.5Y 5/4) fine sandy loam; common medium distinct strong brown (7.5YR 5/8), yellowish brown (10YR 5/6), and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; medium acid; clear wavy boundary.

B3—22 to 25 inches, yellowish brown (10YR 5/6) loamy sand; many medium distinct yellowish red (5YR 5/6) and brown (10YR 5/3) mottles; weak medium subangular blocky structure; friable; medium acid; clear wavy boundary.

IIC1—25 to 34 inches, yellowish brown (10YR 5/6) sand; single grain; loose; medium acid; clear wavy boundary.

IIC2—34 to 60 inches, light olive brown (2.5Y 5/4) sand; single grain; loose; medium acid.

The solum thickness and the depth to sand and gravel range from 20 to 30 inches. Coarse fragments make up 0 to 10 percent of the solum, 0 to 30 percent of the IIC horizon above a depth of 40 inches, and 0 to 60 percent of the IIC horizon below 40 inches. The soil is very strongly acid to medium acid.

The Ap horizon has hue of 10YR, value of 2 through 4, and chroma of 1 through 4. It is fine sandy loam or very fine sandy loam.

The upper part of the B horizon has hue of 7.5YR or 10YR and value and chroma of 4 through 6. It is very fine sandy loam or fine sandy loam. The lower part of the B horizon has hue of 10YR or 2.5Y and value and chroma of 4 through 6. It is sandy loam, loamy fine sand, or loamy sand. The B horizon has weak granular or weak subangular blocky structure, or it is massive. Consistence is friable or very friable.

The IIC horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 2 through 6. It is single grain or massive and is loose or very friable.

Occum series

The Occum series consists of well drained soils formed in loamy alluvial sediments derived mainly from schist and gneiss. Occum soils are on flood plains along the major streams. Slopes range from 0 to 3 percent.

Occum soils are on the landscape with excessively drained Suncook soils, well drained Agawam soils, moderately well drained Pootatuck soils, poorly drained Rippowam soils, and very poorly drained Saco soils.

Typical pedon of Occum fine sandy loam, in the town of Windham, 1/4 mile south of St. Joseph's Cemetery and 2,000 feet west of Connecticut Route 6, in a field:

Ap—0 to 8 inches, dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; friable; many roots; strongly acid; abrupt smooth boundary.

B21—8 to 12 inches, dark yellowish brown (10YR 4/4) fine sandy loam; weak medium granular structure; friable; many roots; strongly acid; clear smooth boundary.

B22—12 to 16 inches, dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) fine sandy loam;

weak medium granular structure; friable; many roots; strongly acid; clear smooth boundary.
B23—16 to 35 inches, yellowish brown (10YR 5/6) fine sandy loam; weak medium granular structure; friable; few roots; strongly acid; gradual smooth boundary.
IIC1—35 to 40 inches, yellowish brown (10YR 5/6) loamy fine sand; single grain; loose; few roots; stongly acid; clear smooth boundary.
IIC2—40 to 60 inches, dark yellowish brown (10YR 4/4) loamy fine sand; single grain; loose; strongly acid.

The solum is 20 to 36 inches thick. Coarse fragments make up 0 to 10 percent of the solum and 0 to 35 percent of the substratum. The soil is very strongly acid to medium acid.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 through 4.

The B horizon has hue of 10YR or 2.5Y, value of 3 through 5, and chroma of 4 through 6. The upper part of the B horizon is fine sandy loam or sandy loam, and the lower part is sandy loam. The horizon has weak or moderate granular or weak subangular blocky structure and is very friable or friable.

The IIC horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 2 through 6. It is loamy fine sand through gravelly coarse sand.

Palms series

The Palms series consists of very poorly drained soils that formed in deposits of herbaceous organic material less than 50 inches thick. Palms soils are in depressions and along slow-flowing streams in glacial till uplands. Slopes range from 0 to 2 percent.

Palms soils are on the landscape with poorly drained Ridgebury and Leicester soils and very poorly drained Adrian, Carlisle, Saco, Scarboro, and Whitman soils. Palms soils have a finer textured substratum than Adrian soils; a thicker organic layer than Saco, Scarboro, or Whitman soils; and a thinner organic layer than Carlisle soils.

Typical pedon of Palms muck, in an area of Adrian and Palms mucks, in the town of Brooklyn, 1/8 mile east of Connecticut Route 169 and 1/4 mile north of the Canterbury town line, in a field:

Oa1—0 to 3 inches, black (10YR 2/1) muck (sapric material) broken face and rubbed; 5 percent fiber, 2 percent rubbed; weak coarse granular structure; friable; few medium roots; herbaceous fibers; medium acid; clear smooth boundary.
Oa2—3 to 9 inches, black (10YR 2/1) muck (sapric material) broken face, very dark brown (10YR 2/2) rubbed; 5 percent fiber; weak coarse subangular blocky structure; friable; few fine roots; herbaceous fibers; medium acid; gradual smooth boundary.
Oa3—9 to 15 inches, very dark brown (10YR 2/2) muck (sapric material) broken face and rubbed; 60 percent fiber, 5 percent rubbed; massive; friable; medium acid; gradual wavy boundary.
Oa4—15 to 21 inches, black (10YR 2/1) muck (sapric material) broken face and rubbed; 40 percent fiber, 5 percent rubbed; massive; friable; medium acid; gradual wavy boundary.
Oa5—21 to 28 inches, very dark brown (10YR 2/2) muck (sapric material) broken face and rubbed; 10 percent fiber, 5 percent rubbed; massive; friable; medium acid; gradual wavy boundary.
Oa6—28 to 30 inches, black (10YR 2/1) muck (sapric material) broken face and rubbed; 70 percent fiber, 10 percent rubbed; massive; friable; medium acid; clear wavy boundary.
IIC1—30 to 41 inches, gray (10YR 5/1) silt loam; common fine distinct reddish yellow (7.5YR 6/6) mottles; massive; slightly acid; gradual wavy boundary.
IIC2—41 to 46 inches, gray (10YR 5/1) fine sandy loam; common fine distinct yellowish brown (10YR 5/4) mottles; massive; slightly acid; gradual wavy boundary.
IIC3—46 to 60 inches, grayish brown (2.5Y 5/2) fine sandy loam; common fine distinct strong brown (7.5YR 5/8) mottles; massive; slightly acid.

The organic layer is 16 to 50 inches thick. Fragments, ranging from 1/8 inch to 6 inches in diameter, of twigs, branches, and logs make up 5 to 15 percent of the organic layer. The soil is strongly acid to medium acid in the organic layer and medium acid to slightly acid in the loamy substratum.

The surface tier has hue of 10YR, value of 2, and chroma of 1 or 2. The subsurface tier has neutral colors or has hue of 10YR through 5YR, value of 2 or 3, and chroma of 0 through 3. Some pedons have a layer of hemic material up to 10 inches thick.

The IIC horizon has hue of 10YR through 5Y, value of 4 or 5, and chroma of 1 or 2. It mainly is silt loam, fine sandy loam, or sandy loam. Some pedons have thin layers of sand.

Paxton series

The Paxton series consists of well drained, nonstony to extremely stony soils formed in compact glacial till derived mainly from schist and gneiss. Paxton soils are on drumlins and roliing hills of glacial till uplands. Slopes range from 3 to 35 percent.

Paxton soils are on the landscape with moderately well drained Woodbridge soils, poorly drained Ridgebury soils, and very poorly drained Whitman soils.

Typical pedon of Paxton fine sandy loam, in an area of Paxton very stony fine sandy loam, 3 to 8 percent slopes, in the town of Ashford, 1/4 mile west of Connecticut Route 89 and 0.6 mile north of Perry Hill Road, in a wooded area:

Ap—0 to 7 inches, dark brown (10YR 3/3) fine sandy loam; weak medium granular structure; friable; many fine and medium roots; slightly acid; clear smooth boundary.
B21—7 to 12 inches, dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; slightly acid; gradual wavy boundary.
B22—12 to 20 inches, yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; common fine roots; 5 percent rock fragments; slightly acid; gradual wavy boundary.
B23—20 to 25 inches, yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; 5 percent rock fragments; medium acid; clear wavy boundary.
C1x—25 to 34 inches, olive brown (2.5Y 4/3) fine sandy loam; moderate thick platy structure; very firm, brittle; 5 percent rock fragments; medium acid; gradual wavy boundary.
C2x—34 to 60 inches, olive brown (2.5Y 4/4) fine sandy loam; moderate thick platy structure; firm, brittle; 10 percent rock fragments; medium acid.

The solum thickness and the depth to the compact layer are 15 to 38 inches. Rock fragments make up 5 to 35 percent of the solum and 10 to 40 percent of the substratum. The soil is very strongly acid to slightly acid.

The A horizon has hue of 10YR, value of 2 through 4, and chroma of 1 through 3. It is fine sandy loam, sandy loam, or loam.

The upper part of the B horizon has hue of 10YR, value of 4 or 5, and chroma of 4 through 8. The lower part of the B horizon has hue of 10YR or 2.5Y and value and chroma of 4 through 6. The B horizon is fine sandy loam, sandy loam, loam, or their gravelly analogues.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 through 6, and chroma of 2 through 4. It is fine sandy loam, sandy loam, loam, or their gravelly analogues. The horizon has weak or moderate platy structure, or it is massive. Consistence is very firm or firm and brittle.

Pootatuck series

The Pootatuck series consists of moderately well drained soils formed in loamy alluvial sediments derived mainly from gneiss and schist. Pootatuck soils are on flood plains along the major streams. Slopes range from 0 to 3 percent.

Pootatuck soils are on the landscape with excessively drained Suncook soils, well drained Occum soils, poorly drained Rippowam soils, and very poorly drained Saco soils.

Typical pedon of Pootatuck fine sandy loam, in the town of Sterling, 1/2 mile west of Sterling Road, 35 feet south of Quaduck Brook, and 100 feet north of an abandoned railroad, in a wooded area:

A1—0 to 5 inches, very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; strongly acid; gradual wavy boundary.
B21—5 to 15 inches, dark brown (10YR 4/3) fine sandy loam; weak medium subangular blocky structure; friable; many fine and medium roots; strongly acid; gradual smooth boundary.
B22—15 to 20 inches, yellowish brown (10YR 5/4) fine sandy loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; strongly acid; clear smooth boundary.
B23—20 to 27 inches, brown (10YR 4/3) sandy loam; common fine distinct light brownish gray (2.5Y 6/2) mottles; weak medium subangular blocky structure; friable; few fine roots; strongly acid; clear wavy boundary.
IIC1—27 to 36 inches, olive brown (2.5Y 4/3) sand; few fine faint brown (10YR 4/3) mottles; single grain; loose; 5 percent coarse fragments; strongly acid; gradual smooth boundary.
IIC2—36 to 60 inches, grayish brown (2.5Y 5/2) sand; few fine distinct dark brown (10YR 4/3) mottles; single grain; loose; 15 percent coarse fragments; strongly acid.

The solum is 20 to 40 inches thick. Coarse fragments make up 0 to 15 percent of the solum and 0 to 40 percent of the substratum. The soil is very strongly acid to medium acid.

The A horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2 through 4. It is dominantly fine sandy loam but ranges to sandy loam.

The B horizon has hue of 10YR through 5Y and value and chroma of 3 through 6. It is fine sandy loam or sandy loam. The horizon has weak granular or weak subangular blocky structure. Consistence is very friable or friable.

The IIC horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 2 through 6. Mottles are distinct or prominent. The horizon mainly is loamy fine sand, loamy sand, sand, or their gravelly analogues. Some pedons have thin layers of silt loam or sandy loam. The horizon is massive or single grain.

Ridgebury series

The Ridgebury series consists of poorly drained, nonstony to extremely stony soils formed in loamy compact glacial till derived mainly from gneiss and schist. Ridgebury soils are in slightly concave areas and shallow drainageways of glacial till uplands. Slopes range from 0 to 3 percent.

Ridgebury soils are on the landscape with well drained Paxton soils, moderately well drained Woodbridge soils, poorly drained Leicester soils, and very poorly drained Whitman soils. Ridgebury soils have a more compact and firm substratum than Leicester soils.

Typical pedon of Ridgebury fine sandy loam, in an area of Ridgebury, Leicester, and Whitman extremely stony fine sandy loams, in the town of Pomfret, 1/4 mile east of Connecticut Route 97 and 200 feet west of Brooklyn Road, in a wooded area:

A1—0 to 8 inches, very dark brown (10YR 2/2) fine sandy loam; weak medium granular structure; friable; many fine and medium roots; strongly acid; abrupt smooth boundary.
B21—8 to 12 inches, light brownish gray (10YR 6/2) fine sandy loam; common medium distinct strong brown (7.5YR 5/6) mottles and common medium faint light brownish gray (2.5Y 6/2) mottles; massive; friable; common fine and medium roots; medium acid; clear smooth boundary.
B22—12 to 16 inches, light brownish gray (2.5Y 6/3) fine sandy loam; common medium faint light brownish gray (10YR 6/2) mottles and common coarse distinct strong brown (7.5YR 5/6) mottles; massive; friable; few fine and medium roots; medium acid; clear wavy boundary.
C1x—16 to 20 inches, grayish brown (2.5Y 5/3) sandy loam; many coarse distinct yellowish red (5YR 4/8) mottles; weak thick platy structure; very firm, brittle; medium acid; gradual wavy boundary.
C2x—20 to 60 inches, light brownish gray (2.5Y 6/3) fine sandy loam; many coarse prominent yellowish red (5YR 4/8) mottles; weak thick platy structure; very firm, brittle; medium acid.

The solum thickness and the depth to the compact layer range from 10 to 30 inches. Rock fragments make up 5 to 35 percent of the soil. The soil is very strongly acid to medium acid.

The A horizon has hue of 10YR through 5Y, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam, sandy loam, or loam.

The upper part of the B horizon has neutral color, or it has hue of 10YR through 2.5Y, value of 4 through 6, and chroma of 0 through 3. Chroma of 3 is restricted to subhorizons. The B horizon is fine sandy loam, sandy loam, loam, or their gravelly analogues. The horizon has weak subangular blocky structure, or it is massive. Consistence is very friable or friable.

The Cx horizon has hue of 10YR through 5Y, value of 3 through 6, and chroma of 1 through 4. It has prominent or distinct mottles that commonly become less abundant with depth. It is fine sandy loam, sandy loam, loam, or their gravelly analogues. The horizon has weak platy structure, or it is massive. It is firm or very firm and brittle.

Rippowam series

The Rippowam series consists of poorly drained soils that formed in recent alluvium derived mainly from gneiss and schist. Rippowam soils are on low flood plains of major streams and their tributaries. Slopes range from 0 to 3 percent.

Rippowam soils are on the landscape with excessively drained Suncook soils, well drained Agawam and Occum soils, moderately well drained Pootatuck soils, and very poorly drained Saco soils.

Typical pedon of Rippowam fine sandy loam, in the town of Thompson, 1/4 mile east of Connecticut Route 12 and 1/2 mile south of the Massachusetts state line, along the west side of the French River:

A1—0 to 7 inches, very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; common fine and medium roots; strongly acid; clear wavy boundary.
B21—7 to 15 inches, dark brown (10YR 4/3) fine sandy loam; few fine distinct strong brown (7.5YR 5/6) mottles and common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine and medium roots; 5 percent coarse fragments; very strongly acid; gradual smooth boundary.
B22—15 to 24 inches, grayish brown (10YR 5/2) fine sandy loam; common fine distinct brown (7.5YR 5/4) mottles; massive; friable; few fine roots; 5 percent coarse fragments; very strongly acid; clear smooth boundary.
B23—24 to 35 inches, dark grayish brown (10YR 4/2) sandy loam; common fine distinct brown (7.5YR 5/4) mottles; massive; friable; 10 percent coarse fragments; very strongly acid; gradual smooth boundary.
IIC1—35 to 43 inches, grayish brown (10YR 5/2) gravelly sand; single grain; loose; 25 percent coarse fragments; strongly acid; gradual smooth boundary.
IIC2—43 to 60 inches, gray (10YR 5/1) gravelly sand; single grain; loose; 30 percent coarse fragments; medium acid.

The solum is 20 to 40 inches thick. Coarse fragments make up 0 to 15 percent of the solum and 0 to 40 percent of the substratum. The soil is very strongly acid to medium acid.

The A1 horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam or sandy loam.

The B horizon has hue of 10YR through 5Y, value of 3 through 6, and chroma of 1 through 3. It is fine sandy loam or sandy loam. It has many or common, prominent or distinct mottles. The horizon has granular or subangular blocky structure, or it is massive. Consistence is very friable or friable.

The IIC horizon has hue of 10YR through 5Y, value of 3 through 6, and chroma of 1 through 3. It is loamy fine sand, loamy sand, sand, coarse sand, or their gravelly analogues. The horizon is massive or single grain and very friable or loose.

Saco series

The Saco series consists of very poorly drained soils that formed in recent alluvial sediments derived mainly from gneiss, schist, and granite. Saco soils are on the lowest parts of the flood plains of major streams and rivers. Slopes range from 0 to 2 percent but are dominantly 0 to 1 percent.

Saco soils are on the landscape with excessively drained Suncook soils, well drained Agawam and Occum soils, moderately well drained Ninigret and Pootatuck soils, and poorly drained Rippowam soils.

Typical pedon of Saco silt loam, in the town of Killingly, 1,000 feet north of Connecticut Route 101 and 600 feet west of Soap Street:

O2—3 inches to 0, grass and partially decomposed deciduous leaf litter.
A11—0 to 10 inches, black (10YR 2/1) silt loam; weak medium granular structure; very friable; many fine and medium roots; strongly acid; gradual smooth boundary.
A12—10 to 14 inches, black (10YR 2/1) silt loam; few fine prominent strong brown (7.5YR 5/8) mottles; weak coarse granular structure; very friable; common fine and medium roots; strongly acid; gradual wavy boundary.
C1g—14 to 17 inches, dark gray (5Y 4/1) silt loam; few fine prominent red (2.5YR 4/8) mottles and many fine prominent strong brown (7.5YR 5/8) mottles; massive; friable; few fine roots; strongly acid; clear wavy boundary.
C2g—17 to 41 inches, dark gray (5Y 4/1) silt loam; lenses of very fine sand; massive; friable; few fine roots; medium acid; gradual wavy boundary.
IIC3g—41 to 60 inches, gray (5Y 5/1) stratified sand and gravel; single grain; loose; 35 percent coarse fragments; slightly acid.

The depth to sand and gravel is more than 40 inches. Coarse fragments make up 0 to 5 percent of the soil above a depth of 40 inches and 0 to 50 percent below a depth of 40 inches. The soil is strongly acid to medium acid above a depth of 40 inches and medium acid to slightly acid below 40 inches.

The A horizon has hue of 7.5YR through 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is silt loam or very fine sandy loam. The horizon has weak granular structure, or it is massive. Consistence is very friable or friable.

The Cg horizon has neutral colors or has hue of 10YR through 5Y, value of 3 through 6, and chroma of 0 or 1. The horizon is silt loam or very fine sandy loam, and consistence is very friable or friable.

The IIC horizon has neutral colors or has hue of 10YR through 5Y, value of 3 through 6, and chroma of 0 through 2. It is sand or stratified sand and gravel.

Scarboro series

The Scarboro series consists of very poorly drained soils that formed in stratified deposits of sand and gravel derived mainly from schist and gneiss. Scarboro soils are in small drainageways and depressions of outwash plains and terraces. Slopes range from 0 to 2 percent.

Scarboro soils are on the landscape with excessively drained Windsor soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, moderately well drained Sudbury soils, poorly drained Walpole soils, and very poorly drained Adrian and Palms soils. Scarboro soils have a thinner organic layer than Adrian or Palms soils.

Typical pedon of Scarboro fine sandy loam, in the town of Plainfield, 1/4 mile south of the intersection of Tarbox Road and Lillibridge Road and 100 feet west of Tarbox Road, in a field:

O2—4 inches to 0, black (10YR 2/1) muck (sapric material) broken face and rubbed; 90 percent fiber, 10 percent rubbed; many roots; weak medium granular structure; friable; herbaceous and woody fibers; very strongly acid; abrupt smooth boundary.
A11—0 to 6 inches, very dark gray (10YR 3/1) fine sandy loam; weak medium granular structure; friable; common fine roots; strongly acid; gradual smooth boundary.
A12—6 to 10 inches, black (10YR 2/1) sandy loam; weak medium granular structure; friable; few fine roots; strongly acid; gradual smooth boundary.
A13—10 to 14 inches, black (10YR 2/1) and dark grayish brown (2.5Y 4/2) sandy loam; weak medium granular structure; friable; 10 percent coarse fragments; strongly acid; clear wavy boundary.
C1—14 to 26 inches, grayish brown (2.5Y 5/2) loamy sand; few fine faint reddish yellow (7.5YR 6/8) mottles; single grain; loose; 10 percent coarse fragments; strongly acid; gradual wavy boundary.
C2—26 to 60 inches, grayish brown (2.5Y 5/2) sand; common medium distinct reddish yellow (7.5YR 6/8) mottles; single grain; loose; 10 percent coarse fragments; strongly acid.

Coarse fragments make up 0 to 10 percent of the soil above a depth of 30 inches and 0 to 50 percent below a depth of 30 inches. The soil is very strongly acid to medium acid.

The O horizon has neutral colors or has hue of 10YR or 2.5Y, value of 2, and chroma of 0 or 1. The horizon ranges from 1 to 4 inches thick.

The A horizon has hue of 7.5YR through 2.5Y, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam, sandy loam, or their mucky analogues.

The Cg horizon has neutral colors or has hue of 10YR through 5Y, value of 4 through 6, and chroma of 0 through 2. The horizon is loamy sand, sand, or their gravelly analogues. It is massive or single grain and very friable or loose.

Sudbury series

The Sudbury series consists of moderately well drained soils that formed in water-sorted sand and gravel deposits derived mainly from gneiss and schist. Sudbury soils are in slight depressions and on gentle, concave slopes at the base of upland hills. Slopes range from 0 to 5 percent.

Sudbury soils are on the landscape with excessively drained Hinckley and Windsor soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, moderately well drained Ninigret soils, poorly drained Walpole soils, and very poorly drained Scarboro soils. Sudbury soils have more sand in the solum than Ninigret soils.

Typical pedon of Sudbury sandy loam, in the town of Brooklyn, 1/4 mile east of Allen Hill Road and 200 feet south of South Street, in a wooded area:

Ap—0 to 10 inches, dark brown (10YR 4/3) sandy loam; weak fine granular structure; very friable; many fine and medium roots; 5 percent coarse fragments; very strongly acid; clear wavy boundary.

B21—10 to 17 inches, yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; 10 percent coarse fragments; very strongly acid; gradual wavy boundary.

B22—17 to 22 inches, strong brown (7.5YR 5/6) gravelly sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; 20 percent coarse fragments; strongly acid; clear wavy boundary.

B23—22 to 28 inches, yellowish brown (10YR 5/4) gravelly loamy sand; few fine distinct yellowish red (5YR 5/8) mottles and common medium distinct grayish brown (10YR 5/2) mottles; massive; very friable; 30 percent coarse fragments; strongly acid; clear wavy boundary.

IIC1—28 to 35 inches, light brownish gray (10YR 6/2) and dark gray (10YR 4/1) stratified sand and gravel; single grain; loose; 50 percent coarse fragments; strongly acid; clear wavy boundary.

IIC2—35 to 60 inches, light brownish gray (10YR 6/2) and dark gray (10YR 4/1) stratified sand and gravel; few medium distinct yellowish red (5YR 5/6) mottles; single grain; loose; 70 percent coarse fragments; strongly acid.

The solum is 18 to 30 inches thick. Coarse fragments make up 0 to 30 percent of the solum and 20 to 75 percent of the substratum. The soil is very strongly acid to medium acid.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 through 4. It is sandy loam or fine sandy loam.

The B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 through 8. Mottles are distinct or prominent. The upper part of the B horizon is fine sandy loam or sandy loam, and the lower part is sandy loam, loamy sand, sand, or their gravelly analogues. The horizon has weak granular or subangular blocky structure, or it is massive. Consistence is very friable or friable.

The IIC horizon has hue of 10YR through 5Y, value of 5 or 6, and chroma of 2 through 4. It ranges from gravelly sand to very gravelly coarse sand but is stratified sand and gravel in most pedons.

Suncook series

The Suncook series consists of excessively drained soils that formed in sandy alluvial sediments derived mainly from gneiss and schist. Suncook soils are on the higher parts of the flood plains of major streams. Slopes range from 0 to 3 percent.

Suncook soils are on the landscape with well drained Occum soils, moderately well drained Pootatuck soils, poorly drained Rippowam soils, and very poorly drained Saco soils.

Typical pedon of Suncook loamy fine sand, in the town of Canterbury, 1 mile south of Canterbury Center on Connecticut Route 169 and 100 feet west of the Quinebaug River, in a wooded area:

Ap—0 to 9 inches, dark brown (10YR 3/3) loamy fine sand; weak medium granular structure; very friable; common fine and medium roots; very strongly acid; clear wavy boundary.

C1—9 to 25 inches, dark yellowish brown (10YR 4/4) loamy sand; single grain; loose; common fine and medium roots; strongly acid; gradual wavy boundary.

C2—25 to 40 inches, yellowish brown (10YR 5/4) sand; single grain; loose; few fine and medium roots; strongly acid; clear wavy boundary.

C3—40 to 47 inches, dark brown (10YR 4/3) sand; single grain; loose; few fine roots; medium acid; gradual wavy boundary.

C4—47 to 55 inches, dark yellowish brown (10YR 4/4) sand; single grain; loose; medium acid; gradual wavy boundary.

C5—55 to 60 inches, dark brown (10YR 4/3) sand; single grain; loose; medium acid.

Coarse fragments make up 0 to 10 percent of the soil above a depth of 20 inches, 0 to 20 percent between depths of 20 and 40 inches, and 0 to 40 percent below 40 inches. This soil is very strongly acid to slightly acid.

The Ap horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 through 3. It is loamy fine sand or loamy sand. The horizon has weak granular structure, or it is single grain. Consistence is very friable or loose.

The C horizon has hue of 7.5YR through 2.5Y, value of 3 through 6, and chroma of 1 through 4. It is loamy fine sand, loamy sand, sand, coarse sand, or their gravelly analogues.

Sutton series

The Sutton series consists of moderately well drained, nonstony to extremely stony soils that formed in loamy glacial till derived mainly from schist and gneiss. Sutton soils are on the lower concave slopes of hillsides and in slight depressions of glacial till uplands. Slopes range from 0 to 8 percent.

Sutton soils are on the landscape with well drained Canton, Charlton, and Paxton soils; moderately well drained Woodbridge soils; poorly drained Leicester and Ridgebury soils; and very poorly drained Whitman soils. Sutton soils have a more friable substratum than Woodbridge soils.

Typical pedon of Sutton fine sandy loam, in an area of Sutton very stony fine sandy loam, 3 to 8 percent slopes, in the town of Pomfret, 1/2 mile northwest of the junction of Dennis Road and Taft Pond Road, in a wooded area:

O2—3 inches to 0, decomposed and partially decomposed leaves and roots.

A1—0 to 5 inches, dark brown (7.5YR 4/4) fine sandy loam; weak medium granular structure; friable; common fine and medium roots; 10 percent rock fragments; strongly acid; gradual wavy boundary.

B21—5 to 20 inches, yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; 10 percent rock fragments; strongly acid; gradual wavy boundary.

B22—20 to 30 inches, yellowish brown (10YR 5/4) fine sandy loam; common fine distinct light brownish gray (2.5Y 6/2) and strong brown (7.5YR 5/6) mottles; massive; friable; few fine and medium roots; 10 percent rock fragments; strongly acid; gradual wavy boundary.

B23—30 to 35 inches, yellowish brown (10YR 5/4) sandy loam; many medium distinct olive gray (5Y 5/2) and reddish brown (5YR 5/4) mottles; massive; friable; few fine roots; 15 percent rock fragments; strongly acid; clear wavy boundary.

C—35 to 60 inches, light olive brown (2.5Y 5/4) sandy loam; many medium distinct dark grayish brown (2.5Y 4/2) and reddish brown (5YR 4/4) mottles; massive; friable; 10 percent rock fragments; strongly acid.

The solum is 20 to 36 inches thick. Rock fragments make up 5 to 35 percent of the soil. The soil is very strongly acid to medium acid.

The A horizon has hue of 7.5YR or 10YR, value of 2 through 4, and chroma of 1 through 4. It is dominantly fine sandy loam but ranges to very fine sandy loam and loam.

The upper part of the B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 through 6; the lower part has hue of 10YR through 5Y, value of 4 or 5, and chroma of 2 through 6. The horizon is fine sandy loam, sandy loam, or loam. It has weak granular or subangular blocky structure, or it is massive. Consistence is very friable or friable.

The C horizon has hue of 2.5Y or 5Y, value of 4 through 6, and chroma of 2 through 4. The horizon is fine sandy loam, sandy loam, or their gravelly analogues and is friable or very friable. Some pedons have firm lenses.

Udorthents

Udorthents consist of excessively drained to moderately well drained soils that have been altered by cutting, filling, or grading. The areas either have had 2 feet or more of the upper part of the original soil removed or have more than 2 feet of fill material on top of the original soil. Udorthents formed in loamy glacial till or gravelly outwash. The soils are on glacial till plains and outwash plains and stream terraces. Slopes range from 0 to 15 percent.

Udorthents are on the landscape with excessively drained Hinckley and Windsor soils; somewhat excessively drained Gloucester and Merrimac soils; well drained Agawam, Canton, Charlton, and Paxton soils; and moderately well drained Ninigret, Sudbury, Sutton, and Woodbridge soils.

Because of the variability of Udorthents, a typical pedon is not given. Udorthents are commonly more than 60 inches thick and are 10 to 65 percent rock fragments. Reaction is very strongly acid to slightly acid.

The A horizon has neutral colors or has hue of 5YR through 2.5Y, value of 2 through 4, and chroma of 0 through 6. It is sandy loam through loam or their gravelly analogues.

The C horizon has hue of 7.5YR through 5Y, value of 3 through 6, and chroma of 2 through 8. It is sandy loam through loam.

Walpole series

The Walpole series consists of poorly drained soils that formed in sandy and gravelly deposits derived mainly from schist and gneiss. Walpole soils are in low, wet areas on outwash plains and stream terraces. Slopes range from 0 to 3 percent.

Walpole soils are on the landscape with excessively drained Hinckley soils, somewhat excessively drained Merrimac soils, well drained Agawam soils, moderately well drained Ninigret and Sudbury soils, and very poorly drained Scarboro soils.

Typical pedon of Walpole sandy loam, in the town of Killingly, 300 feet north of Connecticut Route 101 and 700 feet south of Alexander's Lake, in a wooded area:

O2—1 inch to 0, partially decomposed leaf litter and roots.

A1—0 to 6 inches, very dark brown (10YR 2/2) sandy loam; weak medium granular structure; friable; many

fine and medium roots; 8 percent coarse fragments; very strongly acid; clear smooth boundary.
B21—6 to 12 inches, dark grayish brown (2.5Y 4/2) sandy loam; common medium distinct yellowish brown (10YR 5/4) and light olive brown (2.5Y 5/4) mottles; massive; friable; common fine and few medium roots; 10 percent coarse fragments; strongly acid; gradual wavy boundary.
B22—12 to 19 inches, dark grayish brown (2.5Y 4/2) sandy loam; common medium distinct strong brown (7.5YR 5/6), yellowish brown (10YR 5/6), and light brownish gray (2.5Y 6/2) mottles; massive; friable; few fine roots; 10 percent coarse fragments; strongly acid; gradual smooth boundary.
B23—19 to 23 inches, grayish brown (2.5Y 5/3) gravelly sandy loam; common medium distinct yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), and dark grayish brown (2.5Y 4/2) mottles; massive; friable; 20 percent coarse fragments; strongly acid; gradual smooth boundary.
IIC1—23 to 39 inches, light brownish gray (2.5Y 6/3) gravelly loamy sand; common medium distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/4) mottles; massive; very friable; 35 percent coarse fragments; strongly acid; gradual smooth boundary.
IIC2—39 to 60 inches, light brownish gray (10YR 6/2) gravelly sand; brown (10YR 5/4) stains; single grain; loose; 40 percent coarse fragments; medium acid.

The solum is 18 to 28 inches thick. Coarse fragments make up 0 to 25 percent of the solum and 0 to 50 percent of the substratum. The soil is very strongly acid to medium acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is dominantly sandy loam but ranges to include fine sandy loam.

The B horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 1 through 3. The horizon is dominantly sandy loam but ranges to include fine sandy loam or their gravelly analogues. It has weak granular or subangular blocky structure, or the horizon is massive.

The IIC horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 2 through 4. It is loamy sand, sand, or their gravelly analogues. Some pedons have thin strata of fine sandy loam or loam. Consistence is very friable or loose.

Whitman series

The Whitman series consists of very poorly drained, extremely stony soils that formed in compact glacial till derived mainly from schist and gneiss. Whitman soils are in depressions and small drainageways on glacial till uplands. Slopes range from 0 to 3 percent.

Whitman soils are on the landscape with well drained Canton, Charlton, and Paxton soils; moderately well drained Sutton and Woodbridge soils; and poorly drained Leicester and Ridgebury soils.

Typical pedon of Whitman fine sandy loam, in an area of Ridgebury, Leicester, and Whitman extremely stony fine sandy loams, in the town of Killingly, 1/2 mile north of Connecticut Route 101 along North Road and 1/2 mile west of Chase Reservoir, in a wooded area:

A1—0 to 9 inches, very dark gray (10YR 3/1) fine sandy loam; weak medium granular structure; friable; many fine roots; 5 percent rock fragments; very strongly acid; clear wavy boundary.
B2g—9 to 14 inches, gray (5Y 5/1) fine sandy loam; few fine distinct yellowish brown (10YR 5/4) mottles; brown root stains in old root channels; weak medium subangular blocky structure; friable; few fine roots; 5 percent rock fragments; strongly acid; clear wavy boundary.
C1xg—14 to 20 inches, light olive gray (5YR 6/2) fine sandy loam; few fine faint light olive brown (2.5Y 5/4) and yellowish red (5YR 4/6) mottles; dark reddish brown stains in old root channels; weak medium platy structure; firm, brittle; 10 percent rock fragments; strongly acid; gradual smooth boundary.
C2xg—20 to 29 inches, light olive gray (5Y 6/2) sandy loam; common medium prominent brown (7.5YR 5/4) mottles and many coarse distinct gray (10YR 5/1) mottles; moderate very coarse platy structure; very firm, brittle; 15 percent rock fragments; strongly acid; gradual wavy boundary.
C3xg—29 to 60 inches, light olive gray (5Y 6/2) sandy loam; common fine distinct yellowish brown (10YR 5/4) and dark reddish brown (5YR 3/2) mottles; moderate thick platy structure; very firm, brittle; 15 percent rock fragments; slightly acid.

The thickness of the solum and the depth to the compact substratum are 10 to 30 inches. Rock fragments make up 5 to 35 percent of the soil. The soil is very strongly acid to slightly acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam, sandy loam, loam, or silt loam. The horizon has weak or moderate, medium granular structure.

The B2g horizon has neutral colors or has hue of 10YR through 5Y, value of 4 through 6, and chroma of 0 or 1. It is fine sandy loam, sandy loam, or loam. Consistence is very friable to firm.

The Cxg horizon has hue of 2.5Y or 5Y, value of 4 through 6, and chroma of 0 through 2. It is fine sandy loam, sandy loam, loam, loamy fine sand, or loamy sand. Consistence is firm to extremely firm and brittle.

Windsor series

The Windsor series consist of excessively drained soils that formed in sandy outwash derived mainly from schist and gneiss. Windsor soils are on outwash plains and stream terraces. Slopes range from 0 to 8 percent.

Windsor soils are on the landscape with excessively drained Hinckley soils, somewhat excessively drained

Merrimac soils, well drained Agawam soils, moderately well drained Sudbury soils, and very poorly drained Scarboro soils. Windsor soils have fewer coarse fragments than Hinckley soils.

Typical pedon of Windsor loamy sand, 0 to 3 percent slopes, in the town of Plainfield, 1 mile west of Central Village along Connecticut Route 14 and 1/4 mile south of the intersection of Route 14 and Jackson Road, in a wooded area:

O2—2 inches to 0, decomposed and partially decomposed leaf litter and pine needles.
Ap—0 to 7 inches, dark brown (7.5YR 4/4) loamy sand; weak medium granular structure; very friable; many fine and medium roots; strongly acid; gradual smooth boundary.
B21—7 to 12 inches, dark yellowish brown (10YR 4/6) loamy sand; weak medium granular structure; very friable; many fine and medium roots; medium acid; gradual smooth boundary.
B22—12 to 25 inches, yellowish brown (10YR 5/6) loamy sand; weak medium granular structure; very friable; common fine and medium roots; medium acid; gradual smooth boundary.
B23—25 to 32 inches, yellowish brown (10YR 5/4) loamy sand; weak medium granular structure; few fine and medium roots; medium acid; gradual smooth boundary.
C—32 to 60 inches, light olive brown (2.5Y 5/4) sand; single grain; loose; few fine and medium roots; medium acid.

The solum is 20 to 32 inches thick. Coarse fragments make up 0 to 10 percent of the solum and 0 to 15 of the substratum. The soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 through 4. It is loamy fine sand or loamy sand.

The upper part of the B horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 4 through 8. It is loamy fine sand or loamy sand. The lower part has hue of 7.5YR through 5Y, value of 4 through 6, and chroma of 2 through 6. It is loamy fine sand, loamy sand, or sand. The horizon has weak granular or subangular blocky structure, or it is massive. Consistence is very friable or loose.

The C horizon has hue of 10YR or 2.5Y, value of 5 through 7, and chroma of 2 through 6. It is sand or fine sand.

Woodbridge series

The Woodbridge series consists of moderately well drained, nonstony to extremely stony soils that formed in compact glacial till derived mainly from schist and gneiss. Woodbridge soils are on drumlins and hills of glacial till uplands. Slopes range from 0 to 15 percent.

Woodbridge soils are on the landscape with well drained Paxton soils, poorly drained Leicester and Ridgebury soils, and very poorly drained Whitman soils.

Typical pedon of Woodbridge fine sandy loam, 0 to 3 percent slopes, in the town of Plainfield, 3/4 mile south of Connecticut Route 14A and 100 feet east of Spaulding Road, in a wooded area:

Ap—0 to 8 inches, very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; friable; many fine and medium roots; 5 percent rock fragments; strongly acid; abrupt smooth boundary.
B21—8 to 16 inches, dark yellowish brown (10YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; 5 percent rock fragments; very strongly acid; gradual wavy boundary.
B22—16 to 25 inches, yellowish brown (10YR 5/4) fine sandy loam; common medium distinct light brownish gray (2.5Y 6/2) and reddish yellow (7.5YR 6/6) mottles; weak medium subangular blocky structure; friable; common fine and few medium roots; 5 percent rock fragments; strongly acid; gradual wavy boundary.
B23—25 to 30 inches, yellowish brown (10YR 5/4) fine sandy loam; common medium distinct light brownish gray (2.5Y 6/2) and few fine faint reddish yellow (7.5YR 6/6) mottles; weak medium subangular blocky structure; friable; few fine and medium roots; 15 percent rock fragments; medium acid; clear wavy boundary.
C1x—30 to 40 inches, olive gray (5Y 5/2) fine sandy loam; many medium prominent strong brown (7.5YR 5/8) mottles; massive; firm, brittle; 15 percent rock fragments; slightly acid; gradual wavy boundary.
C2x—40 to 60 inches, olive gray (5Y 5/2) gravelly fine sandy loam; many medium prominent strong brown (7.5YR 5/8) mottles; massive; very firm; brittle; 30 percent rock fragments; slightly acid.

The solum thickness and depth to the compact substratum are 15 to 38 inches. Rock fragments make up 5 to 35 percent of the solum and 10 to 40 percent of the substratum. The soil is very strongly acid to medium acid in the surface layer and subsoil and very strongly acid to slightly acid in the substratum.

The A horizon has hue of 10YR, value of 2 through 4, and chroma of 1 through 3. It is fine sandy loam, sandy loam, or loam. It has weak medium granular structure. The consistence is very friable or friable.

The upper part of the B horizon has hue of 7.5YR or 10YR, value of 3 through 5, and chroma of 3 through 8.

The lower part has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 3 through 6. The horizon is dominantly fine sandy loam but ranges to sandy loam, loam, or their gravelly analogues. It has weak medium or coarse subangular blocky structure, or it is massive. Consistence is very friable or friable.

The Cx horizon has hue of 2.5Y or 5Y, value of 4 through 6, and chroma of 2 through 4. The horizon is fine sandy loam, sandy loam, loam, or their gravelly analogues. It has weak medium or thick platy structure, or it is massive. Consistence is firm or very firm and brittle.

formation of the soils

David E. Hill, associate soil scientist, Connecticut Agricultural Experiment Station, assisted with the preparation of this section.

Soil is produced by physical and chemical processes acting upon geologic materials. Hence, soil formation is a continuing process. Some processes occur seasonally, and others develop slowly over hundreds, even thousands of years. The changes that occur as raw materials develop into mature soils are influenced by five factors of soil formation: parent material, climate, living organisms, relief, and time (*3*). Each one modifies the effects of the others. Climate and living organisms are the dominant active processes that modify the parent material deposited by geologic events. In Windham County, these active forces have influenced soil formation for at least 10,000 years, or since the last glacier.

The soil characteristics produced by soil formation are the sum of many physical and chemical processes. For example, glacial ice ground bedrock and moved it to different locations. Meltwaters from the glacier transported particles of sediment even farther from their source and deposited them, forming new landscapes. As the climate warmed and vegetation became established, chemical processes and weathering began to exert an increasing influence on soil formation. Oxidation turned the parent materials a rusty brown. Hydrolysis and hydration altered primary clay-sized particles to secondary clay minerals. Carbonate minerals in the soil from pulverized limestone and marble formations, although rare in the county, dissolved and were removed by rainwater that leached through the soil. Iron oxide impurities in the limestone and marble were left in the soil.

The morphological differences observed among soils in Windham County are primarily attributable to differences in parent material, relief, and time. The influence of climate and living organisms has been relatively uniform throughout the county and does not account for major differences in soils. Rocks pulverized by the glaciers have provided the parent material. Relief has influenced soil formation through differences in slope and drainage. Some soils are being deposited even now on the flood plains of rivers and streams. Hence, they are very young in comparison to the soils of the uplands which have been developing for thousands of years.

Each of the soil-forming factors, as it applies to the morphology of soils in Windham County, is described in the paragraphs that follow.

parent material

Soils inherit some of their characteristics from the parent material; other characteristics are acquired as the parent material is modified by chemical and physical weathering. Parent materials from the grayish granite, gneiss, and schist of the Eastern Highlands region produce acid, yellowish brown soils. The Brimfield schist in the northwestern part of the county contains abundant iron pyrite which imparts a rusty reddish hue to the soils. Fresh parent materials derived from this pyrite-bearing rock have become extremely acid when exposed to air. The iron sulfides become oxidized to sulfate and sulfuric acid and have at several locations produced extremely acid water in farm ponds and lakes.

The sand and silt fractions of most soils in the county are dominated by quartz, feldspar, and mica. The dominant clay mineral in all parent materials is illite that is commonly interstratified with vermiculite. As chemical weathering proceeds in the surface layer and subsoil, illite loses potassium from its structure and becomes hydrolized to form vermiculite. Vermiculite is the most abundant clay mineral in the surface layer and subsoil and accounts for some increase in the cation exchange capacity of surface soils compared to unweathered minerals in the parent material. Small amounts of chlorite, kaolinite, and hydrated iron oxides are in the clay fraction of most soils.

The texture of a soil is largely determined by geologic events but is modified by physical and chemical weathering to produce finer textures at the surface of most soils. Material that was deposited directly by the glacier mainly consists of a heterogeneous mixture of particle sizes ranging from large boulders to clay. Particles carried by water from the melting glacier were sorted to form stratified deposits of gravel, sand, and silt. These deposits are most extensive along the valleys of the Quinebaug River and its tributaries and the Natchaug and Little Rivers, tributaries of the Shetucket River system. Isolated stratified deposits also are high above the valley floors where they were deposited by melting masses of ice that choked the valleys.

Some parent materials are organic and have formed from the remains of aquatic plants. These organic deposits are scattered throughout the county.

climate

The elements of climate that affect soil formation are temperature and precipitation, which react directly upon the parent material and vegetation. These elements are uniform throughout the county.

At least half of the precipitation percolates through the soil and alters its chemical composition over a long period of time. Soluble chemical constituents produced by weathering are mobilized by water. Some are translocated only short distances and are reprecipitated; others are leached away. Rainfall also causes unprotected soils to erode. The effects of erosion are particularly noticeable on steep cultivated soils.

High temperatures cause biological activity, which in turn causes organic matter to decompose at a fairly rapid rate. Frost-action in winter causes seasonal aggregation of fine soil particles and enhances percolation and leaching potential.

plants and animals

One of the features that distinguishes a soil from its parent material is the presence of plants and animals or their decayed remains. Although vegetation is the most common type of living organism, soil formation is more strongly influenced by other life forms, mainly micro-organisms, earthworms, larvae, burrowing animals, and man.

Rodents, worms, and other animal life have constantly mixed soil layers, bringing fresh parent material to the surface and subjecting it to weathering processes. Man has influenced soil formation by burning and clearing forested land and by draining and fertilizing.

relief

The effects of relief on soil formation are primarily expressed in terms of slope gradient, orientation, and elevation. In places where parent materials are similar, soils formed on steep slopes are thinner and more poorly expressed than soils formed on more gentle slopes. Level areas, especially those underlain by compact slowly permeable glacial till known locally as hardpan, have soils with poor drainage and a perched water table. Soils saturated with water for an appreciable time display mottling in the subsoil and greater thickness and content of organic matter in the topsoil.

The effects of slope orientation and elevation are minimal. Bedrock structures and numerous drumlins are oriented roughly north to south so that east- and west-facing slopes predominate. Thus the typical effects of north-facing slopes being cooler and moister and south-facing slopes being warmer and dryer are not well expressed. The highest elevations in the county are in the towns of Ashford and Woodstock, where some hilltops exceed 1,000 feet. Most hilltops in the northwestern part of the county range from 800 to 1,000 feet and in the southeastern part decrease in elevation to about 450 to 550 feet.

Extensive terraces of stratified sand and gravel are in the valleys of the major rivers and streams incising the Eastern Highlands. The elevation of these terraces along the Quinebaug River ranges from 350 feet in the north to 100 feet in the south.

time

The degree of profile expression is partly dependent upon the duration of the soil-forming processes. In terms of pedological time, the soils of Windham County are relatively young. The layers of these young soils are weakly developed except for their color. In the New England Uplands, where parent materials are mostly granite, gneiss, and schist, color is well developed in the subsoil. The soils of recent alluvial origin are younger than the surrounding upland soils and do not have the color development that characterizes the older upland soils. Many of the alluvial soils continue to receive fresh sediment during floods.

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glossary

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	More than 5.2

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a fragment.

Chiseling. Tillage with an implement having one or more soil-penetrating points that loosen the subsoil and bring clods to the surface. A form of emergency tillage to control soil blowing.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.
Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.
Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.
Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Esker (geology). A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial melt water.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial melt water. Many deposits are interbedded or laminated.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:
O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.
A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.
B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the

overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame (geology). An irregular, short ridge or hill of stratified glacial drift.

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an

arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to insure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	O.5 to 0.25
Fine sand	O.25 to 0.10
Very fine sand	O.10 to 0.05
Silt	O.05 to 0.002
Clay	Less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1953-74 at Mansfield, Conn.]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	35.0	12.8	23.9	60	-17	10	2.92	1.59	4.00	6	11.3
February	37.1	15.4	26.3	60	-14	12	3.10	2.11	3.99	7	11.2
March	45.3	24.7	35.0	71	4	34	3.66	2.32	4.87	7	10.2
April	58.7	33.9	46.3	84	14	205	3.73	2.28	5.02	7	1.6
May	69.4	42.4	56.0	90	26	496	3.26	2.00	4.39	7	.0
June	78.2	52.1	65.2	95	33	756	2.91	1.48	4.07	7	.0
July	82.9	57.4	70.2	96	41	936	3.79	2.05	5.20	7	.0
August	81.4	55.6	68.5	93	37	884	3.89	2.05	5.40	6	.0
September	74.2	48.2	61.2	91	27	636	3.99	2.07	5.55	6	.0
October	64.4	36.6	50.5	84	17	332	3.38	1.81	4.66	5	.0
November	51.6	30.0	40.8	72	11	79	4.03	2.82	5.13	8	.8
December	39.1	18.7	28.9	63	-7	31	4.34	2.27	6.03	8	9.4
Year	59.8	35.7	47.7	97	-20	4,411	43.00	35.92	49.75	81	44.5

[1]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1953-74 at Mansfield, Conn.]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	May 1	May 22	June 5
2 years in 10 later than--	April 26	May 16	May 31
5 years in 10 later than--	April 15	May 5	May 22
First freezing temperature in fall:			
1 year in 10 earlier than--	October 1	September 20	September 11
2 years in 10 earlier than--	October 7	September 26	September 15
5 years in 10 earlier than--	October 17	October 7	September 23

TABLE 3.--GROWING SEASON

[Recorded in the period 1953-74 at Mansfield, Conn.]

Probability	Length of growing season if daily minimum temperature is--		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	163	127	104
8 years in 10	170	136	110
5 years in 10	184	154	123
2 years in 10	198	172	136
1 year in 10	206	181	143

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
Aa	Adrian and Palms mucks	4,350	1.3
AfA	Agawam fine sandy loam, 0 to 3 percent slopes	1,030	0.3
AfB	Agawam fine sandy loam, 3 to 8 percent slopes	830	0.2
BkC	Brookfield-Brimfield fine sandy loams, very rocky, 3 to 15 percent slopes	2,050	0.6
BkD	Brookfield-Brimfield fine sandy loams, very rocky, 15 to 35 percent slopes	720	0.2
CbB	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	6,250	1.9
CbC	Canton and Charlton fine sandy loams, 8 to 15 percent slopes	1,950	0.6
CcB	Canton and Charlton very stony fine sandy loams, 3 to 8 percent slopes	14,000	4.2
CcC	Canton and Charlton very stony fine sandy loams, 8 to 15 percent slopes	4,300	1.3
CdC	Canton and Charlton extremely stony fine sandy loams, 3 to 15 percent slopes	17,800	5.4
CdD	Canton and Charlton extremely stony fine sandy loams, 15 to 35 percent slopes	5,200	1.6
Ce	Carlisle muck	9,350	2.8
CrC	Charlton-Hollis fine sandy loams, very rocky, 3 to 15 percent slopes	39,000	11.8
CrD	Charlton-Hollis fine sandy loams, very rocky, 15 to 35 percent slopes	8,900	2.7
GbB	Gloucester very stony sandy loam, 3 to 8 percent slopes	1,570	0.5
GbC	Gloucester very stony sandy loam, 8 to 15 percent slopes	670	0.2
GeC	Gloucester extremely stony sandy loam, 3 to 15 percent slopes	3,350	1.0
GeD	Gloucester extremely stony sandy loam, 15 to 35 percent slopes	900	0.3
HkA	Hinckley gravelly sandy loam, 0 to 3 percent slopes	2,200	0.7
HkC	Hinckley gravelly sandy loam, 3 to 15 percent slopes	23,500	7.1
HkD	Hinckley gravelly sandy loam, 15 to 40 percent slopes	6,150	1.8
HrC	Hollis-Charlton-Rock outcrop complex, 3 to 15 percent slopes	1,700	0.5
HrD	Hollis-Charlton-Rock outcrop complex, 15 to 35 percent slopes	1,750	0.5
MyA	Merrimac sandy loam, 0 to 3 percent slopes	3,650	1.1
MyB	Merrimac sandy loam, 3 to 8 percent slopes	3,000	0.9
Nn	Ninigret fine sandy loam	2,100	0.6
On	Occum fine sandy loam	550	0.2
PbB	Paxton fine sandy loam, 3 to 8 percent slopes	6,000	1.8
PbC	Paxton fine sandy loam, 8 to 15 percent slopes	2,700	0.8
PbD	Paxton fine sandy loam, 15 to 25 percent slopes	1,000	0.3
PdB	Paxton very stony fine sandy loam, 3 to 8 percent slopes	8,700	2.6
PdC	Paxton very stony fine sandy loam, 8 to 15 percent slopes	3,200	1.0
PeC	Paxton extremely stony fine sandy loam, 3 to 15 percent slopes	5,200	1.6
PeD	Paxton extremely stony fine sandy loam, 15 to 35 percent slopes	3,500	1.1
Pr	Pits, gravel	1,600	0.5
Ps	Pootatuck fine sandy loam	2,170	0.7
Rd	Ridgebury fine sandy loam	1,700	0.5
Rn	Ridgebury, Leicester, and Whitman extremely stony fine sandy loams	34,000	10.3
Ru	Rippowam fine sandy loam	3,500	1.1
Sb	Saco silt loam	4,850	1.5
Sf	Scarboro fine sandy loam	2,400	0.7
Sg	Sudbury sandy loam	3,500	1.1
St	Suncook loamy fine sand	1,500	0.4
SvA	Sutton fine sandy loam, 0 to 3 percent slopes	180	0.1
SvB	Sutton fine sandy loam, 3 to 8 percent slopes	2,000	0.6
SwA	Sutton very stony fine sandy loam, 0 to 3 percent slopes	320	0.1
SwB	Sutton very stony fine sandy loam, 3 to 8 percent slopes	3,000	0.9
SxB	Sutton extremely stony fine sandy loam, 3 to 8 percent slopes	5,200	1.6
Ud	Udorthents, smoothed	4,000	1.2
Wd	Walpole sandy loam	950	0.3
WvA	Windsor loamy sand, 0 to 3 percent slopes	1,200	0.4
WvB	Windsor loamy sand, 3 to 8 percent slopes	1,000	0.3
WxA	Woodbridge fine sandy loam, 0 to 3 percent slopes	3,300	1.0
WxB	Woodbridge fine sandy loam, 3 to 8 percent slopes	9,800	3.0
WxC	Woodbridge fine sandy loam, 8 to 15 percent slopes	2,000	0.6
WyA	Woodbridge very stony fine sandy loam, 0 to 3 percent slopes	4,000	1.2
WyB	Woodbridge very stony fine sandy loam, 3 to 8 percent slopes	11,950	3.6
WyC	Woodbridge very stony fine sandy loam, 8 to 15 percent slopes	1,300	0.4
WzA	Woodbridge extremely stony fine sandy loam, 0 to 3 percent slopes	3,500	1.1
WzC	Woodbridge extremely stony fine sandy loam, 3 to 15 percent slopes	22,500	6.8
	Water	1,700	0.5
	Total	330,240	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Corn silage	Irish potatoes	Alfalfa hay	Grass-legume hay	Grass hay	Grass-clover	Kentucky bluegrass
	Ton	Cwt	Ton	Ton	Ton	AUM*	AUM*
Aa---------- Adrian and Palms	---	---	---	---	---	---	---
AfA---------- Agawam	24	330	5.0	4.5	4.0	8.5	---
AfB---------- Agawam	24	330	5.0	4.5	4.0	8.5	---
BkC, BkD---------- Brookfield-Brimfield	---	---	---	---	---	---	2.1
CbB---------- Canton and Charlton	24	300	5.0	4.5	4.0	8.5	---
CbC---------- Canton and Charlton	22	270	5.0	4.0	3.5	7.5	---
CcB, CcC---------- Canton and Charlton	---	---	---	---	---	---	3.2
CdC, CdD---------- Canton and Charlton	---	---	---	---	---	---	3.2
Ce---------- Carlisle	---	---	---	---	---	---	---
CrC, CrD---------- Charlton-Hollis	---	---	---	---	---	---	3.2
GbB, GbC---------- Gloucester	---	---	---	---	---	---	2.0
GeC, GeD---------- Gloucester	---	---	---	---	---	---	2.0
HkA---------- Hinckley	12	---	2.5	2.0	2.0	3.6	---
HkC---------- Hinckley	---	---	---	---	---	2.5	2.0
HkD---------- Hinckley	---	---	---	---	---	2.0	1.5
HrC---------- Hollis-Charlton-Rock outcrop	---	---	---	---	---	---	1.5
HrD---------- Hollis-Charlton-Rock outcrop	---	---	---	---	---	---	1.5
MyA, MyB---------- Merrimac	18	270	4.0	3.0	2.5	5.7	---
Nn---------- Ninigret	22	330	4.0	3.5	4.0	5.8	---
On---------- Occum	24	330	4.5	4.0	3.5	7.0	---
PbB---------- Paxton	24	330	4.5	4.0	4.0	7.5	---

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Irish potatoes	Alfalfa hay	Grass-legume hay	Grass hay	Grass-clover	Kentucky bluegrass
	Ton	Cwt	Ton	Ton	Ton	AUM*	AUM*
PbC---------- Paxton	22	300	4.5	4.0	4.0	7.5	---
PbD---------- Paxton	20	---	4.0	3.5	3.5	6.5	---
PdB, PdC---------- Paxton	---	---	---	---	---	---	3.2
PeC, PeD---------- Paxton	---	---	---	---	---	---	3.2
Pr**. Pits							
Ps---------- Pootatuck	24	275	4.0	4.5	4.5	8.5	---
Rd---------- Ridgebury	16	---	---	3.5	4.0	6.5	---
Rn---------- Ridgebury, Leicester and Whitman	---	---	---	---	---	---	2.2
Ru---------- Rippowam	20	---	---	4.0	4.0	7.0	---
Sb---------- Saco	---	---	---	---	---	---	---
Sf---------- Scarboro	---	---	---	---	---	---	---
Sg---------- Sudbury	18	270	3.5	4.0	4.0	7.6	---
St---------- Suncook	12	240	2.5	2.0	2.0	3.5	---
SvA, SvB---------- Sutton	22	270	4.0	4.0	4.0	---	---
SwA, SwB---------- Sutton	---	---	---	---	---	---	3.2
SxB---------- Sutton	---	---	---	---	---	---	3.0
Ud**. Udorthents							
Wd---------- Walpole	18	---	---	3.0	3.0	5.5	---
WvA, WvB---------- Windsor	14	---	3.0	2.5	2.0	5.5	---
WxA, WxB---------- Woodbridge	24	270	4.0	4.0	4.0	8.0	---

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn silage	Irish potatoes	Alfalfa hay	Grass-legume hay	Grass hay	Grass-clover	Kentucky bluegrass
	Ton	Cwt	Ton	Ton	Ton	AUM*	AUM*
WxC---------- Woodbridge	22	240	4.0	4.0	4.0	7.5	---
WyA, WyB, WyC---------- Woodbridge	---	---	---	---	---	---	3.2
WzA, WzC---------- Woodbridge	---	---	---	---	---	---	3.0

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.
** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	1,580	---	---	---
II	42,780	13,080	23,050	6,650
III	18,700	6,650	6,150	5,900
IV	24,500	1,000	---	23,500
V	6,720	---	2,400	4,320
VI	109,990	---	18,550	91,440
VII	118,670	---	---	118,670
VIII	---	---	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
AfA, AfB---------- Agawam	4o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak---- Sugar maple---------	64 60 ---	Eastern white pine, European larch.
BkC*: Brookfield--------	4o	Slight	Slight	Slight	Slight	Northern red oak---- Sugar maple--------- Eastern white pine--	60 55 65	Eastern white pine, eastern hemlock, European larch.
Brimfield---------	5d	Slight	Slight	Severe	Moderate	Northern red oak---- Eastern white pine--	45 55	Eastern white pine, eastern hemlock.
BkD*: Brookfield--------	4r	Slight	Moderate	Slight	Slight	Northern red oak---- Sugar maple--------- Eastern white pine--	60 55 65	Eastern white pine, eastern hemlock, European larch.
Brimfield---------	5d	Slight	Moderate	Severe	Moderate	Northern red oak---- Eastern white pine--	45 55	Eastern white pine, eastern hemlock.
CbB*, CbC*: Canton----------	5o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak----	58 52	Eastern white pine, European larch.
Charlton----------	4o	Slight	Slight	Slight	Slight	Northern red oak---- Eastern white pine-- Shagbark hickory---- Sugar maple---------	65 65 --- 55	Eastern white pine, eastern hemlock, European larch.
CcB*, CcC*: Canton----------	5o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak----	58 52	Eastern white pine, European larch.
Charlton----------	4o	Slight	Slight	Slight	Slight	Northern red oak---- Eastern white pine-- Shagbark hickory---- Sugar maple---------	65 65 --- 55	Eastern white pine, eastern hemlock, European larch.
CdC*, CdD*: Canton----------	5x	Slight	Moderate	Slight	Slight	Eastern white pine-- Northern red oak----	58 52	Eastern white pine, European larch.
Charlton----------	4x	Slight	Moderate	Slight	Slight	Northern red oak---- Eastern white pine-- Shagbark hickory---- Sugar maple---------	65 65 --- 55	Eastern white pine, eastern hemlock, European larch.
CrC*: Charlton----------	4o	Slight	Slight	Slight	Slight	Northern red oak---- Eastern white pine-- Shagbark hickory---- Sugar maple---------	65 65 --- 55	Eastern white pine, eastern hemlock, European larch.
Hollis----------	5d	Slight	Slight	Severe	Moderate	Northern red oak---- Eastern white pine-- Sugar maple---------	47 55 56	Eastern white pine, eastern hemlock.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
CrD*:								
Charlton	4r	Slight	Moderate	Slight	Slight	Northern red oak	65	Eastern white pine, eastern hemlock, European larch.
						Eastern white pine	65	
						Shagbark hickory	---	
						Sugar maple	55	
						Red maple	55	
Hollis	5d	Slight	Moderate	Severe	Moderate	Northern red oak	47	Eastern white pine, eastern hemlock.
						Eastern white pine	55	
						Sugar maple	56	
GbB, GbC	4s	Slight	Slight	Moderate	Slight	Northern red oak	60	Eastern white pine, European larch.
Gloucester						Eastern white pine	61	
GeC	4x	Slight	Moderate	Moderate	Slight	Northern red oak	60	Eastern white pine, European larch.
Gloucester						Eastern white pine	61	
GeD	4x	Slight	Moderate	Moderate	Slight	Northern red oak	60	Eastern white pine, European larch.
Gloucester						Eastern white pine	61	
HkA, HkC	5s	Slight	Slight	Severe	Slight	Northern red oak	49	Eastern white pine, European larch.
Hinckley						Eastern white pine	60	
						Sugar maple	57	
HkD	5s	Slight	Moderate	Severe	Slight	Northern red oak	49	Eastern white pine, European larch.
Hinckley						Eastern white pine	60	
						Sugar maple	57	
HrC*:								
Hollis	5d	Slight	Slight	Severe	Moderate	Northern red oak	47	Eastern white pine, eastern hemlock.
						Eastern white pine	55	
						Sugar maple	56	
Charlton	4o	Slight	Slight	Slight	Slight	Northern red oak	65	Eastern white pine, eastern hemlock, European larch.
						Eastern white pine	65	
						Shagbark hickory	---	
						Sugar maple	57	
Rock outcrop.								
HrD*:								
Hollis	5d	Slight	Moderate	Severe	Moderate	Northern red oak	47	Eastern white pine, eastern hemlock.
						Eastern white pine	55	
						Sugar maple	56	
Charlton	4r	Slight	Moderate	Slight	Slight	Northern red oak	65	Eastern white pine, eastern hemlock, European larch, hemlock, European
						Eastern white pine	65	
						Shagbark hickory	---	
						Sugar maple	57	
Rock outcrop.								
MyA, MyB	4s	Slight	Slight	Moderate	Slight	Northern red oak	55	Eastern white pine, European larch.
Merrimac						Eastern white pine	64	
						Sugar maple	58	
Nn	3o	Slight	Slight	Slight	Slight	Eastern white pine	75	Eastern white pine, European larch.
Ninigret						Red maple	60	
						Northern red oak	65	
						Sugar maple	55	
On	3o	Slight	Slight	Slight	Slight	Eastern white pine	70	Eastern white pine.
Occum						Northern red oak	65	
						Sugar maple	60	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
PbB, PbC---------- Paxton	3o	Slight	Slight	Slight	Slight	Northern red oak----	72	Eastern white pine, European larch.
						Eastern white pine--	66	
						Sugar maple---------	75	
PbD---------- Paxton	3r	Slight	Moderate	Slight	Slight	Northern red oak----	72	Eastern white pine, European larch.
						Eastern white pine--	66	
						Sugar maple---------	75	
PdB, PdC---------- Paxton	3o	Slight	Slight	Slight	Slight	Northern red oak----	72	Eastern white pine, European larch.
						Eastern white pine--	66	
						Sugar maple---------	75	
PeC---------- Paxton	3x	Slight	Moderate	Slight	Slight	Northern red oak----	72	Eastern white pine, European larch.
						Eastern white pine--	66	
						Sugar maple---------	75	
PeD---------- Paxton	3x	Slight	Moderate	Slight	Slight	Northern red oak----	72	Eastern white pine, European larch.
						Eastern white pine--	66	
						Sugar maple---------	75	
Ps---------- Pootatuck	3o	Slight	Slight	Slight	Slight	Eastern white pine--	75	Eastern white pine.
						Red maple-----------	60	
						Yellow birch--------	60	
Rd---------- Ridgebury	4w	Slight	Severe	Severe	Severe	Northern red oak----	57	Eastern white pine.
						Eastern white pine--	63	
						Sugar maple---------	52	
						Red maple-----------	---	
Rn*:								
Ridgebury---------	4x	Slight	Severe	Severe	Severe	Northern red oak----	57	Eastern white pine.
						Eastern white pine--	63	
						Sugar maple---------	52	
						Red maple-----------	---	
Leicester---------	4x	Slight	Severe	Severe	Severe	Northern red oak----	56	Eastern white pine.
						Eastern white pine--	69	
						Red maple-----------	70	
Whitman-----------	5x	Slight	Severe	Severe	Severe	Eastern white pine--	56	
						Red maple-----------	55	
Ru---------- Rippowam	4w	Slight	Severe	Severe	Severe	Red maple-----------	75	Eastern white pine.
						Eastern white pine--	65	
						White ash-----------	---	
Sb---------- Saco	5w	Slight	Severe	Severe	Severe	Eastern white pine--	50	
						Red maple-----------	50	
Sf---------- Scarboro	5w	Slight	Severe	Severe	Severe	Eastern white pine--	55	
						Red maple-----------	55	
Sg---------- Sudbury	4o	Slight	Slight	Slight	Slight	Eastern white pine--	60	Eastern white pine, European larch.
						Northern red oak----	45	
St---------- Suncook	5s	Slight	Slight	Severe	Slight	Eastern white pine--	55	Eastern white pine.
						Black oak-----------	50	
						Northern red oak----	50	
						Red maple-----------	50	
SvA, SvB, SwA, SwB- Sutton	4o	Slight	Slight	Slight	Slight	Sugar maple---------	54	Eastern white pine, European larch.
						Northern red oak----	62	
						Eastern white pine--	62	
						Black cherry--------	72	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
SxB---------- Sutton	4x	Slight	Moderate	Slight	Slight	Sugar maple--------- Northern red oak---- Eastern white pine-- Black cherry--------	54 62 62 72	Eastern white pine, European larch.
Wd---------- Walpole	4w	Slight	Severe	Severe	Severe	Eastern white pine-- Red maple----------	68 75	Eastern white pine.
WvA, WvB---------- Windsor	5s	Slight	Slight	Severe	Slight	Eastern white pine-- Northern red oak---- Sugar maple---------	57 52 55	Eastern white pine.
WxA, WxB, WxC------ Woodbridge	3o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak---- Sugar maple---------	67 72 65	Eastern white pine, European larch.
WyA, WyB, WyC------ Woodbridge	3o	Slight	Slight	Slight	Slight	Eastern white pine-- Northern red oak---- Sugar maple---------	67 72 65	Eastern white pine, European larch.
WzA, WzC---------- Woodbridge	3x	Moderate	Moderate	Slight	Slight	Eastern white pine-- Northern red oak---- Sugar maple---------	67 72 65	Eastern white pine, European larch.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Aa*:					
Adrian	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.
Palms	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
AfA	Slight	Slight	Slight	Slight	Slight.
Agawam					
AfB	Slight	Slight	Moderate: slope.	Slight	Slight.
Agawam					
BkC*:					
Brookfield	Moderate: large stones, slope.	Moderate: slope, large stones.	Severe: slope, large stones.	Slight	Moderate: slope, large stones.
Brimfield	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, large stones, depth to rock.	Slight	Severe: thin layer.
BkD*:					
Brookfield	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Moderate: slope.	Severe: slope.
Brimfield	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, large stones, depth to rock.	Moderate: slope.	Severe: slope, thin layer.
CbB*:					
Canton	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
Charlton	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
CbC*:					
Canton	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Charlton	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
CcB*:					
Canton	Moderate: large stones.	Moderate: large stones.	Severe: large stones.	Slight	Moderate: large stones.
Charlton	Moderate: large stones.	Moderate: large stones.	Severe: large stones.	Slight	Moderate: large stones.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CcC*:					
Canton	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Slight	Moderate: slope, large stones.
Charlton	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Slight	Moderate: slope, large stones.
CdC*:					
Canton	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Slight	Moderate: slope, large stones.
Charlton	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Slight	Moderate: slope, large stones.
CdD*:					
Canton	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Moderate: slope.	Severe: slope.
Charlton	Severe: large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Moderate: slope.	Severe: slope.
Ce	Severe:	Severe:	Severe:	Severe:	Severe:
Carlisle	ponding, excess humus.	ponding, excess humus.	excess humus, ponding.	ponding, excess humus.	excess humus, ponding.
CrC*:					
Charlton	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Slight	Moderate: slope, large stones.
Hollis	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock, large stones.	Slight	Severe: thin layer.
CrD*:					
Charlton	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Moderate: slope.	Severe: slope.
Hollis	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock, large stones.	Moderate: slope.	Severe: slope, thin layer.
GbB	Moderate:	Moderate:	Severe:	Slight	Moderate:
Gloucester	large stones.	large stones.	large stones, small stones.		small stones, droughty.
GbC	Moderate:	Moderate:	Severe:	Slight	Moderate:
Gloucester	slope, large stones.	slope, large stones.	slope, large stones, small stones.		slope, small stones, droughty.
GeC	Severe:	Severe:	Severe:	Slight	Severe:
Gloucester	large stones.	large stones.	slope, large stones, small stones.		large stones.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GeD---------- Gloucester	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones, small stones.	Moderate: slope.	Severe: slope, large stones.
HkA---------- Hinckley	Severe: small stones.	Severe: small stones.	Severe: small stones.	Slight----------	Severe: small stones.
HkC---------- Hinckley	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight----------	Severe: small stones.
HkD---------- Hinckley	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.	Severe: small stones, slope.
HrC*: Hollis----------	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock, large stones.	Slight----------	Severe: thin layer.
Charlton----------	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Slight----------	Moderate: slope, large stones.
Rock outcrop.					
HrD*: Hollis----------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock, large stones.	Moderate: slope.	Severe: slope, thin layer.
Charlton----------	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Moderate: slope.	Severe: slope.
Rock outcrop.					
MyA---------- Merrimac	Slight----------	Slight----------	Moderate: small stones.	Slight----------	Slight.
MyB---------- Merrimac	Slight----------	Slight----------	Moderate: slope, small stones.	Slight----------	Slight.
Nn---------- Ninigret	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
On---------- Occum	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Moderate: flooding.	Severe: flooding.
PbB---------- Paxton	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly, small stones.	Slight----------	Slight.
PbC---------- Paxton	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
PbD---------- Paxton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
PdB---------- Paxton	Moderate: percs slowly, large stones.	Moderate: large stones, percs slowly.	Severe: large stones.	Slight----------	Moderate: large stones.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
PdC--- Paxton	Moderate: slope, large stones, percs slowly.	Moderate: slope, large stones, percs slowly.	Severe: slope, large stones.	Slight---	Moderate: slope, large stones.
PeC--- Paxton	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Slight---	Moderate: slope, large stones.
PeD--- Paxton	Severe: slope, large stones.	Severe: large stones, slope.	Severe: slope, large stones.	Moderate: slope.	Severe: slope.
Pr*. Pits					
Ps--- Pootatuck	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
Rd--- Ridgebury	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Rn*: Ridgebury---	Severe: large stones, wetness, percs slowly.	Severe: large stones, wetness, percs slowly.	Severe: wetness, large stones, percs slowly.	Severe: wetness.	Severe: wetness.
Leicester---	Severe: large stones, wetness.	Severe: large stones, wetness.	Severe: wetness, large stones.	Severe: wetness.	Severe: wetness.
Whitman---	Severe: large stones, ponding.	Severe: large stones, ponding.	Severe: ponding, large stones.	Severe: ponding.	Severe: ponding.
Ru--- Rippowam	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Sb--- Saco	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus.	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus.	Severe: flooding, wetness.
Sf--- Scarboro	Severe: ponding, excess humus, too sandy.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, excess humus.
Sg--- Sudbury	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, small stones.	Moderate: wetness.	Moderate: wetness.
St--- Suncook	Severe: flooding.	Moderate: flooding.	Severe: flooding.	Slight---	Moderate: droughty, floods.
SvA--- Sutton	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
SvB--- Sutton	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Moderate: wetness.	Moderate: wetness.
SwA--- Sutton	Moderate: large stones, wetness.	Moderate: large stones, wetness.	Moderate: large stones, wetness.	Moderate: wetness.	Moderate: large stones, wetness.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
SwB---------- Sutton	Moderate: large stones, wetness.	Moderate: large stones, wetness.	Moderate: slope, large stones, wetness.	Moderate: wetness.	Moderate: large stones, wetness.
SxB---------- Sutton	Severe: large stones.	Severe: large stones.	Severe: large stones.	Moderate: wetness.	Moderate: large stones, wetness.
Ud*. Udorthents					
Wd---------- Walpole	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
WvA---------- Windsor	Slight----------	Slight----------	Slight----------	Slight----------	Moderate: droughty.
WvB---------- Windsor	Slight----------	Slight----------	Moderate: slope.	Slight----------	Moderate: droughty.
WxA---------- Woodbridge	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: wetness.	Moderate: wetness.
WxB---------- Woodbridge	Moderate: percs slowly, wetness.	Moderate: percs slowly, wetness.	Moderate: slope, percs slowly, wetness.	Moderate: wetness.	Moderate: wetness.
WxC---------- Woodbridge	Moderate: slope, percs slowly, wetness.	Moderate: slope, percs slowly, wetness.	Severe: slope.	Moderate: wetness.	Moderate: slope, wetness.
WyA, WyB---------- Woodbridge	Moderate: wetness, large stones, percs slowly.	Moderate: wetness, large stones, percs slowly.	Severe: large stones.	Moderate: wetness.	Moderate: large stones, wetness.
WyC---------- Woodbridge	Moderate: slope, wetness, large stones, percs slowly.	Moderate: slope, wetness, large stones, percs slowly.	Severe: slope, large stones.	Moderate: wetness.	Moderate: slope, large stones, wetness.
WzA---------- Woodbridge	Severe: large stones.	Severe: large stones.	Severe: large stones.	Moderate: wetness.	Moderate: large stones, wetness.
WzC---------- Woodbridge	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Moderate: wetness.	Moderate: slope, large stones, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Aa*:										
Adrian	Very poor.	Very poor.	Very poor.	Poor	Poor	Good	Good	Very poor.	Poor	Good.
Palms	Very poor.	Very poor.	Very poor.	Poor	Poor	Good	Good	Very poor.	Poor	Good.
AfA	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Agawam										
AfB	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Agawam										
BkC*, BkD*:										
Brookfield	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Brimfield	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
CbB*:										
Canton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Charlton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CbC*:										
Canton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Charlton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CcB*:										
Canton	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
Charlton	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
CcC*:										
Canton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Charlton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CdC*, CdD*:										
Canton	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Charlton	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Ce	Very poor.	Very poor.	Very poor.	Poor	Poor	Good	Good	Very poor.	Poor	Good.
Carlisle										

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
CrC*, CrD*:										
Charlton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Hollis	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
GbB, GbC Gloucester	Very poor.	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
GeC, GeD Gloucester	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
HkA, HkC, HkD Hinckley	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
HrC*, HrD*:										
Hollis	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Charlton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Rock outcrop.										
MyA, MyB Merrimac	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Nn Ninigret	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
On Occum	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
PbB Paxton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
PbC Paxton	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
PbD Paxton	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
PdB Paxton	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
PdC Paxton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
PeC, PeD Paxton	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Pr*. Pits										
Ps Pootatuck	Poor	Fair	Fair	Good	Good	Poor	Poor	Fair	Good	Poor.
Rd Ridgebury	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Fair.
Rn*:										
Ridgebury	Very poor.	Very poor.	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.
Leicester	Very poor.	Very poor.	Fair	Fair	Fair	Good	Fair	Poor	Fair	Fair.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Rn*: Whitman	Very poor.	Very poor.	Poor	Poor	Poor	Good	Fair	Very poor.	Poor	Fair.
Ru Rippowam	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Sb Saco	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Sf Scarboro	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Sg Sudbury	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
St Suncook	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
SvA Sutton	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
SvB Sutton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SwA Sutton	Very poor.	Poor	Good	Good	Good	Poor	Poor	Poor	Good	Poor.
SwB Sutton	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
SxB Sutton	Very poor.	Very poor.	Good	Good	Good	Poor	Very poor.	Poor	Fair	Very poor.
Ud*. Udorthents										
Wd Walpole	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
WvA, WvB Windsor	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
WxA Woodbridge	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
WxB Woodbridge	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WxC Woodbridge	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WyA Woodbridge	Very poor.	Poor	Good	Good	Good	Poor	Poor	Poor	Good	Poor.
WyB Woodbridge	Very poor.	Poor	Good	Good	Good	Poor	Very poor.	Poor	Good	Very poor.
WyC Woodbridge	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
WzA Woodbridge	Very poor.	Very poor.	Good	Good	Good	Poor	Poor	Poor	Good	Poor.
WzC Woodbridge	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Aa*:						
Adrian	Severe: ponding, cutbanks cave, excess humus.	Severe: ponding, low strength, flooding.	Severe: ponding, flooding.	Severe: ponding, low strength, flooding.	Severe: ponding, low strength, frost action.	Severe: excess humus, ponding, flooding.
Palms	Severe: excess humus, ponding.	Severe: ponding, low strength, flooding.	Severe: ponding, flooding.	Severe: ponding, flooding, low strength.	Severe: ponding, frost action, low strength.	Severe: ponding, flooding, excess humus.
AfA	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Slight.
Agawam						
AfB	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Slight.
Agawam						
BkC*:						
Brookfield	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope, large stones.
Brimfield	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: thin layer, depth to rock.
BkD*:						
Brookfield	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Brimfield	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, thin layer, depth to rock.
CbB*:						
Canton	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Slight.
Charlton	Slight	Slight	Slight	Moderate: slope.	Slight	Slight.
CbC*:						
Canton	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
Charlton	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
CcB*:						
Canton	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: large stones.
Charlton	Slight	Slight	Slight	Moderate: slope.	Slight	Moderate: large stones.
CcC*:						
Canton	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, slope.
Charlton	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, large stones.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CdC*:						
Canton	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, large stones.
Charlton	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, large stones.
CdD*:						
Canton	Severe: slope, cutbanks cave. large stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Charlton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ce	Severe: excess humus, ponding, flooding.	Severe: ponding, low strength, flooding.	Severe: ponding, low strength, flooding.	Severe: ponding, low strength, flooding.	Severe: low strength, ponding, flooding.	Severe: excess humus, ponding, flooding.
Carlisle						
CrC*:						
Charlton	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, large stones.
Hollis	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock, thin layer.
CrD*:						
Charlton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Hollis	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock, thin layer
GbB	Severe: cutbanks cave.	Moderate: large stones.	Moderate: large stones.	Moderate: large stones, slope.	Moderate: large stones.	Moderate: small stones, droughty.
Gloucester						
GbC	Severe: cutbanks cave.	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope, large stones.	Moderate: slope, small stones, droughty.
Gloucester						
GeC	Severe: cutbanks cave.	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope, large stones.	Severe: large stones.
Gloucester						
GeD	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, large stones.
Gloucester						
HkA	Severe: cutbanks cave.	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Moderate: large stones.	Severe: small stones.
Hinckley						
HkC	Severe: cutbanks cave.	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, large stones.	Severe: small stones.
Hinckley						
HkD	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Hinckley						

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HrC*:						
Hollis	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock, thin layer.
Charlton	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope, large stones.
Rock outcrop.						
HrD*:						
Hollis	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock, thin layer.
Charlton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
MyA---- Merrimac	Severe: cutbanks cave.	Slight----	Slight----	Slight----	Slight----	Slight.
MyB---- Merrimac	Severe: cutbanks cave.	Slight----	Slight----	Moderate: slope.	Slight----	Slight.
Nn---- Ninigret	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: frost action, wetness.	Moderate: wetness.
On---- Occum	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
PbB---- Paxton	Moderate: dense layer, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Moderate: frost action, wetness.	Slight.
PbC---- Paxton	Moderate: slope, dense layer, wetness.	Moderate: slope, wetness.	Moderate: slope, wetness.	Severe: slope.	Moderate: slope, frost action, wetness.	Moderate: slope.
PbD---- Paxton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PdB---- Paxton	Moderate: dense layer, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Moderate: frost action, wetness.	Moderate: large stones.
PdC, PeC---- Paxton	Moderate: slope, dense layer, wetness.	Moderate: slope, wetness.	Moderate: slope, wetness.	Severe: slope.	Moderate: slope, frost action, wetness.	Moderate: slope, large stones.
PeD---- Paxton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Pr*. Pits						
Ps---- Pootatuck	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.
Rd---- Ridgebury	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Rn*: Ridgebury	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
Leicester	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
Whitman	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: frost action, ponding.	Severe: ponding.
Ru--- Rippowam	Severe: wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness, frost action.	Severe: wetness, flooding.
Sb--- Saco	Severe: wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness, frost action.	Severe: flooding, wetness.
Sf--- Scarboro	Severe: cutbanks cave, excess humus, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding, excess humus.
Sg--- Sudbury	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Slight.
St--- Suncook	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
SvA--- Sutton	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: frost action, wetness.	Slight.
SvB--- Sutton	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: frost action, wetness.	Slight.
SwA--- Sutton	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: frost action, wetness.	Moderate: large stones.
SwB--- Sutton	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Moderate: frost action, wetness.	Moderate: large stones.
SxB--- Sutton	Severe: wetness, large stones.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: frost action, large stones.	Moderate: large stones.
Ud*. Udorthents						
Wd--- Walpole	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
WvA--- Windsor	Severe: cutbanks cave.	Slight---	Slight---	Slight---	Slight---	Moderate: droughty.
WvB--- Windsor	Severe: cutbanks cave.	Slight---	Slight---	Moderate: slope.	Slight---	Moderate: droughty.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
WxA---------- Woodbridge	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: wetness.
WxB---------- Woodbridge	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Severe: frost action.	Moderate: wetness.
WxC---------- Woodbridge	Severe: wetness.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope.	Severe: frost action.	Moderate: slope, wetness.
WyA---------- Woodbridge	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: large stones, wetness.
WyB---------- Woodbridge	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Severe: frost action.	Moderate: large stones, wetness.
WyC---------- Woodbridge	Severe: wetness.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope.	Severe: frost action.	Moderate: slope, large stones, wetness.
WzA---------- Woodbridge	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: large stones, wetness.
WzC---------- Woodbridge	Severe: wetness.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope.	Severe: frost action.	Moderate: slope, large stones, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Aa*:					
Adrian	Severe: ponding, poor filter, flooding.	Severe: seepage, ponding, excess humus.	Severe: ponding, seepage, flooding.	Severe: ponding, seepage, flooding.	Poor: ponding, excess humus.
Palms	Severe: flooding, subsides, ponding.	Severe: seepage, excess humus, ponding.	Severe: ponding, flooding, excess humus.	Severe: ponding, flooding, seepage.	Poor: ponding, excess humus.
AfA, AfB	Severe:	Severe:	Severe:	Severe:	Poor:
Agawam	poor filter.	seepage.	seepage, too sandy.	seepage.	seepage, too sandy.
BkC*:					
Brookfield	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
Brimfield	Severe: depth to rock.	Severe: depth to rock, slope, seepage.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim, thin layer.
BkD*:					
Brookfield	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Brimfield	Severe: depth to rock, slope.	Severe: depth to rock, slope, seepage.	Severe: depth to rock, slope, seepage.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, thin layer, slope.
CbB*:					
Canton	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones, thin layer.
Charlton	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.
CbC*:					
Canton	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Fair: slope, small stones.
Charlton	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, small stones.
CcB*:					
Canton	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones, thin layer.
Charlton	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: small stones.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CcC*:					
Canton	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Fair: slope, small stones.
Charlton	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, small stones.
CdC*:					
Canton	Moderate: slope.	Severe: slope, seepage.	Severe: seepage.	Severe: seepage.	Fair: slope, small stones.
Charlton	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, small stones.
CdD*:					
Canton	Severe: slope.	Severe: slope, seepage.	Severe: seepage, slope.	Severe: slope, seepage.	Poor: slope.
Charlton	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Ce	Severe: flooding, ponding.	Severe: excess humus, seepage, flooding.	Severe: flooding, ponding, excess humus.	Severe: flooding, ponding, seepage.	Poor: ponding, excess humus.
Carlisle					
CrC*:					
Charlton	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, small stones.
Hollis	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: thin layer, area reclaim.
CrD*:					
Charlton	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Hollis	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, thin layer, area reclaim.
GbB	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones, seepage.
Gloucester					
GbC, GeC	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones, seepage.
Gloucester					
GeD	Severe: slope, poor filter.	Severe: seepage, slope.	Severe: slope, seepage.	Severe: slope, seepage.	Poor: slope, small stones, seepage.
Gloucester					

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
HkA---------- Hinckley	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage, small stones.
HkC---------- Hinckley	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage, small stones.
HkD---------- Hinckley	Severe: slope, poor filter.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: slope, too sandy, seepage.
HrC*: Hollis----------	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: thin layer, area reclaim.
Charlton----------	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, small stones.
Rock outcrop.					
HrD*: Hollis----------	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, thin layer, area reclaim.
Charlton----------	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Rock outcrop.					
MyA, MyB---------- Merrimac	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Nn---------- Ninigret	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: seepage, too sandy, small stones.
On---------- Occum	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage, too sandy.
PbB---------- Paxton	Severe: percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: small stones, wetness.
PbC---------- Paxton	Severe: percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: slope, small stones, wetness.
PbD---------- Paxton	Severe: slope, percs slowly.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
PdB---------- Paxton	Severe: percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: small stones, wetness.
PdC, PeC---------- Paxton	Severe: percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: slope, small stones, wetness.
PeD---------- Paxton	Severe: slope, percs slowly.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Pr*. Pits					
Ps---------- Pootatuck	Severe: flooding, wetness, poor filter.	Severe: seepage, wetness, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: too sandy, seepage, thin layer.
Rd---------- Ridgebury	Severe: percs slowly, wetness.	Slight----------	Severe: wetness.	Severe: wetness.	Poor: wetness.
Rn*: Ridgebury----------	Severe: percs slowly, wetness.	Slight----------	Severe: wetness.	Severe: wetness.	Poor: wetness.
Leicester----------	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
Whitman----------	Severe: percs slowly, ponding.	Slight----------	Severe: ponding.	Severe: ponding.	Poor: ponding.
Ru---------- Rippowam	Severe: flooding, wetness, poor filter.	Severe: wetness, flooding, seepage.	Severe: wetness, flooding, seepage.	Severe: wetness, flooding, seepage.	Poor: wetness, too sandy, seepage.
Sb---------- Saco	Severe: flooding, wetness, poor filter.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness.	Poor: wetness.
Sf---------- Scarboro	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
Sg---------- Sudbury	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: seepage, too sandy, small stones.
St---------- Suncook	Severe: flooding, poor filter.	Severe: flooding, seepage.	Severe: flooding, seepage, too sandy.	Severe: seepage, flooding.	Poor: seepage, too sandy.
SvA, SvB---------- Sutton	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Good.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SwA, SwB---------- Sutton	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Severe: wetness, seepage.	Fair: large stones.
SxB---------- Sutton	Severe: wetness, large stones.	Severe: wetness, seepage.	Severe: wetness, seepage, large stones.	Severe: wetness, seepage.	Poor: large stones.
Ud*. Udorthents					
Wd---------- Walpole	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: wetness, seepage, too sandy.
WvA, WvB---------- Windsor	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: too sandy, seepage.	Poor: too sandy, seepage.
WxA---------- Woodbridge	Severe: percs slowly, wetness.	Slight----------	Severe: wetness.	Moderate: wetness.	Fair: small stones, wetness.
WxB---------- Woodbridge	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Moderate: wetness.	Fair: small stones, wetness.
WxC---------- Woodbridge	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Moderate: slope, wetness.	Fair: slope, small stones, wetness.
WyA---------- Woodbridge	Severe: percs slowly, wetness.	Slight----------	Severe: wetness.	Moderate: small stones.	Fair: small stones, wetness.
WyB---------- Woodbridge	Severe: percs slowly, wetness.	Moderate: slope.	Severe: wetness.	Moderate: small stones.	Fair: small stones, wetness.
WyC---------- Woodbridge	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Moderate: slope, small stones.	Fair: slope, small stones, wetness.
WzA---------- Woodbridge	Severe: percs slowly, wetness.	Slight----------	Severe: wetness.	Moderate: small stones.	Fair: small stones, wetness.
WzC---------- Woodbridge	Severe: percs slowly, wetness.	Severe: slope.	Severe: wetness.	Moderate: slope, small stones.	Fair: slope, small stones, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Aa*:				
Adrian	Poor: wetness, low strength.	Probable	Probable	Poor: wetness, excess humus.
Palms	Poor: wetness, low strength.	Improbable: excess humus, excess fines.	Improbable: excess humus, excess fines.	Poor: wetness, excess humus.
AfA, AfB Agawam	Good	Probable	Probable	Poor: too sandy, area reclaim.
BkC*:				
Brookfield	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Brimfield	Poor: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer.
BkD*:				
Brookfield	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Brimfield	Poor: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, thin layer, slope.
CbB*:				
Canton	Good	Probable	Improbable: too sandy.	Poor: small stones.
Charlton	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
CbC*:				
Canton	Good	Probable	Improbable: too sandy.	Poor: small stones.
Charlton	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, small stones.
CcB*, CcC*:				
Canton	Good	Probable	Improbable: too sandy.	Poor: large stones.
Charlton	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
CdC*:				
Canton	Good	Probable	Improbable: too sandy.	Poor: large stones.
Charlton	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
CdD*:				
Canton	Fair: slope.	Probable	Improbable: too sandy.	Poor: slope, large stones.
Charlton	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
Ce Carlisle	Poor: low strength, wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: wetness, excess humus.
CrC*:				
Charlton	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
Hollis	Poor: thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim.
CrD*:				
Charlton	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
Hollis	Poor: thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones, area reclaim.
GbB, GbC, GeC Gloucester	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
GeD Gloucester	Fair: slope, large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones, area reclaim.
HkA, HkC Hinckley	Good	Probable	Probable	Poor: too sandy, area reclaim, small stones.
HkD Hinckley	Fair: slope.	Probable	Probable	Poor: slope, too sandy, small stones.
HrC*:				
Hollis	Poor: thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim.
Charlton	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
Rock outcrop.				
HrD*:				
Hollis	Poor: thin layer, area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones, area reclaim.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
HrD*: Charlton	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, large stones.
Rock outcrop.				
MyA, MyB Merrimac	Good	Probable	Probable	Poor: small stones, area reclaim.
Nn Ninigret	Fair: wetness.	Probable	Probable	Poor: area reclaim.
On Occum	Good	Probable	Improbable: excess fines.	Fair: small stones, area reclaim.
PbB Paxton	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
PbC Paxton	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, small stones, area reclaim.
PbD Paxton	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
PdB, PdC, PeC Paxton	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
PeD Paxton	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Pr*. Pits				
Ps Pootatuck	Fair: wetness.	Probable	Improbable: too sandy.	Fair: thin layer.
Rd Ridgebury	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, small stones, area reclaim.
Rn*: Ridgebury	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, small stones, area reclaim.
Leicester	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, small stones.
Whitman	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, large stones, area reclaim.
Ru Rippowam	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Sb---------- Saco	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: wetness.
Sf---------- Scarboro	Poor: wetness.	Probable----------	Improbable: too sandy.	Poor: too sandy, ponding.
Sg---------- Sudbury	Fair: wetness.	Probable----------	Probable----------	Poor: small stones, too sandy, area reclaim.
St---------- Suncook	Good----------	Probable----------	Improbable: too sandy.	Poor: too sandy.
SvA, SvB---------- Sutton	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
SwA, SwB---------- Sutton	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
SxB---------- Sutton	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
Ud*. Udorthents				
Wd---------- Walpole	Poor: wetness.	Probable----------	Probable----------	Poor: wetness, small stones.
WvA, WvB---------- Windsor	Good----------	Probable----------	Improbable: excess fines.	Poor: too sandy.
WxA, WxB---------- Woodbridge	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
WxC---------- Woodbridge	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope, small stones, area reclaim.
WyA, WyB, WyC, WzA, WzC---------- Woodbridge	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
Aa*:						
Adrian	Severe: seepage.	Severe: seepage, ponding, excess humus.	Severe: cutbanks cave.	Ponding, subsides, flooding.	Ponding, soil blowing, too sandy.	Wetness.
Palms	Severe: seepage.	Severe: excess humus, ponding.	Slight	Flooding, ponding, subsides.	Ponding, soil blowing.	Wetness.
AfA, AfB Agawam	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Too sandy	Favorable.
BkC*, BkD*:						
Brookfield	Severe: seepage, slope.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Slope	Slope.
Brimfield	Severe: depth to rock, slope, seepage.	Severe: thin layer.	Severe: no water.	Deep to water	Depth to rock, slope.	Depth to rock, slope.
CbB*:						
Canton	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, small stones, too sandy.	Favorable.
Charlton	Severe: seepage.	Moderate: piping, seepage.	Severe: no water.	Deep to water	Favorable	Favorable.
CbC*:						
Canton	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, small stones, too sandy.	Slope.
Charlton	Severe: slope, seepage.	Moderate: piping, seepage.	Severe: no water.	Deep to water	Slope	Slope.
CcB*:						
Canton	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, large stones, too sandy.	Large stones.
Charlton	Severe: seepage.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Large stones	Large stones.
CcC*, CdC*, CdD*:						
Canton	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, large stones, too sandy.	Slope, large stones.
Charlton	Severe: slope, seepage.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Slope, large stones.	Slope, large stones.
Ce Carlisle	Severe: seepage.	Severe: excess humus, ponding.	Slight	Subsides, flooding, frost action.	Wetness, soil blowing.	Wetness.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
CrC*:						
Charlton	Severe: slope, seepage.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Slope, large stones.	Slope, large stones.
Hollis	Severe: depth to rock, slope.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
CrD*:						
Charlton	Severe: slope, seepage.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Slope, large stones.	Slope, large stones.
Hollis	Severe: slope, depth to rock.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
GbB---------- Gloucester	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, too sandy.	Large stones, droughty.
GbC, GeC, GeD----- Gloucester	Severe: slope, seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, too sandy.	Slope, large stones, droughty.
HkA---------- Hinckley	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Large stones, too sandy.	Large stones, droughty.
HkC, HkD---------- Hinckley	Severe: slope, seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones, too sandy.	Large stones, droughty, slope.
HrC*:						
Hollis	Severe: depth to rock.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
Charlton	Severe: slope, seepage.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Slope, large stones.	Slope, large stones.
Rock outcrop.						
HrD*:						
Hollis	Severe: slope, depth to rock.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock.
Charlton	Severe: slope, seepage.	Moderate: seepage, piping.	Severe: no water.	Deep to water	Slope, large stones.	Slope, large stones.
Rock outcrop.						
MyA, MyB---------- Merrimac	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Too sandy------	Favorable.
Nn---------- Ninigret	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, too sandy.	Favorable.
On---------- Occum	Severe: seepage.	Severe: seepage.	Severe: deep to water, cutbanks cave.	Deep to water	Too sandy------	Favorable.
PbB---------- Paxton	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Percs slowly, rooting depth.	Percs slowly, rooting depth.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
PbC, PbD---------- Paxton	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, percs slowly, rooting depth.	Slope, percs slowly, rooting depth.
PdB---------- Paxton	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Rooting depth, percs slowly.	Rooting depth, percs slowly.
PdC, PeC, PeD----- Paxton	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, rooting depth, percs slowly.	Slope, rooting depth, percs slowly.
Pr*. Pits						
Ps---------- Pootatuck	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, too sandy.	Favorable.
Rd---------- Ridgebury	Slight---------	Severe: wetness, piping.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly, rooting depth.	Wetness, percs slowly, rooting depth.
Rn*: Ridgebury--------	Slight---------	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly, rooting depth.	Wetness, percs slowly, rooting depth.
Leicester--------	Severe: seepage.	Severe: wetness.	Moderate: slow refill.	Frost action---	Wetness--------	Wetness.
Whitman----------	Slight---------	Severe: piping, ponding.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly, large stones.	Large stones, wetness, percs slowly.
Ru---------- Rippowam	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave, frost action.	Wetness, too sandy.	Wetness.
Sb---------- Saco	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Flooding, frost action, cutbanks cave.	Wetness--------	Wetness.
Sf---------- Scarboro	Severe: seepage.	Severe: seepage, ponding.	Severe: cutbanks cave.	Cutbanks cave, frost action.	Ponding, too sandy.	Wetness, droughty.
Sg---------- Sudbury	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Too sandy, wetness.	Favorable.
St---------- Suncook	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy------	Too sandy.
SvA, SvB---------- Sutton	Severe: seepage.	Severe: wetness.	Moderate: slow refill.	Slope----------	Slope, wetness.	Slope, wetness.
SwA, SwB, SxB----- Sutton	Severe: seepage.	Severe: wetness.	Moderate: slow refill.	Slope----------	Slope, large stones, wetness.	Slope, wetness, large stones.
Ud*. Udorthents						
Wd---------- Walpole	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness, too sandy.	Wetness.
WvA---------- Windsor	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy------	Droughty.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Terraces and diversions	Grassed waterways
WvB---------- Windsor	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Too sandy------	Droughty.
WxA---------- Woodbridge	Slight---------	Moderate: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Percs slowly, wetness.	Percs slowly, rooting depth.
WxB---------- Woodbridge	Moderate: slope.	Moderate: piping, wetness.	Severe: no water.	Slope, percs slowly, frost action.	Percs slowly, wetness.	Percs slowly, rooting depth.
WxC---------- Woodbridge	Severe: slope.	Moderate: piping, wetness.	Severe: no water.	Slope, percs slowly, frost action.	Slope, percs slowly, wetness.	Slope, percs slowly, rooting depth.
WyA---------- Woodbridge	Slight---------	Moderate: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly.	Percs slowly, rooting depth.
WyB---------- Woodbridge	Moderate: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, slope, frost action.	Wetness, percs slowly.	Percs slowly, rooting depth.
WyC---------- Woodbridge	Severe: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, slope, frost action.	Slope, wetness, percs slowly.	Slope, percs slowly, rooting depth.
WzA---------- Woodbridge	Slight---------	Moderate: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly.	Percs slowly, rooting depth.
WzC---------- Woodbridge	Severe: slope.	Moderate: piping, wetness.	Severe: no water.	Percs slowly, slope, frost action.	Slope, wetness, percs slowly.	Slope, percs slowly, rooting depth.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Aa*:											
Adrian	0-33	Muck	Pt	A-8	---	---	---	---	---	---	---
	33-60	Sand, loamy sand, fine sand.	SP, SM	A-2, A-3, A-1	0	80-100	60-100	35-75	0-30	---	NP
Palms	0-30	Muck	Pt	---	---	---	---	---	---	---	---
	30-60	Silty clay loam, fine sandy loam, silt loam.	CL-ML, CL	A-4, A-6	0	85-100	80-100	70-95	50-90	25-40	5-20
AfA, AfB	0-10	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	65-95	40-65	<25	NP-3
Agawam	10-30	Fine sandy loam, very fine sandy loam, loam.	SM, ML	A-4	0	95-100	85-100	65-95	40-65	<25	NP-3
	30-40	Fine sand, loamy fine sand, loamy sand.	SM, SP-SM	A-2	0	90-100	85-100	40-90	5-35	---	NP
	40-60	Stratified fine sand to very gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-1, A-2, A-3	0-5	50-100	30-100	15-80	5-35	---	NP
BkC*, BkD*:											
Brookfield	0-13	Very stony fine sandy loam.	SM, ML	A-2, A-4	10-15	80-95	75-95	55-80	30-65	<25	NP-3
	13-29	Fine sandy loam, sandy loam, gravelly fine sandy loam.	SM	A-2, A-4	5-15	80-95	75-95	45-70	25-50	<25	NP-3
	29-60	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	75-90	70-85	40-60	25-40	---	NP
Brimfield	0-1	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-15	70-95	60-90	40-85	20-65	<20	NP-3
	1-18	Fine sandy loam, gravelly fine sandy loam, loam.	SM, ML	A-2, A-4	0-15	65-95	55-90	35-85	20-65	<20	NP-3
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
CbB*, CbC*:											
Canton	0-2	Fine sandy loam	SM, ML	A-2, A-4	0-5	85-100	70-95	40-90	25-70	<18	NP
	2-23	Fine sandy loam, gravelly sandy loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	0-15	80-100	65-95	45-90	25-70	<12	NP
	23-60	Gravelly loamy sand, loamy fine sand, gravelly loamy coarse sand.	SM, SP-SM	A-1, A-2, A-3	5-30	75-95	50-85	20-80	5-25	<10	NP
Charlton	0-5	Fine sandy loam	SM, ML	A-2, A-4	0-10	85-95	75-90	50-85	25-65	<25	NP-5
	5-25	Fine sandy loam, sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	40-80	20-65	<25	NP-3
	25-60	Gravelly sandy loam, sandy loam, loam.	SM	A-2, A-4	5-15	60-90	60-85	40-75	20-50	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CcB*, CcC*:											
Canton----------	0-2	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-25	80-100	65-95	45-90	25-70	<18	NP
	2-23	Fine sandy loam, gravelly sandy loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	0-15	80-100	65-95	45-90	25-70	<12	NP
	23-60	Gravelly loamy sand, loamy fine sand, gravelly loamy coarse sand.	SM, SP-SM	A-1, A-2, A-3	5-30	75-95	50-85	20-80	5-25	<10	NP
Charlton--------	0-5	Very stony fine sandy loam.	SM, ML	A-2, A-4	10-20	75-95	70-90	60-85	30-70	<25	NP-5
	5-25	Fine sandy loam, sandy loam. gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-80	20-65	<25	NP-3
	25-60	Fine sandy loam, sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	40-75	20-50	---	NP
CdC*, CdD*:											
Canton----------	0-2	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	15-30	80-95	60-90	40-85	25-70	<15	NP
	2-23	Fine sandy loam, gravelly sandy loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	0-15	80-100	65-95	45-90	25-70	<12	NP
	23-60	Gravelly loamy sand, loamy fine sand, gravelly loamy coarse sand.	SM, SP-SM	A-1, A-2, A-3	5-30	75-95	50-85	20-80	5-25	<10	NP
Charlton--------	0-5	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	15-25	75-95	70-90	60-85	30-70	<25	NP-5
	5-25	Fine sandy loam, sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-80	20-65	<25	NP-3
	25-60	Fine sandy loam, sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	40-75	20-50	---	NP
Ce---------- Carlisle	0-60	Muck----------	Pt	A-8	---	---	---	---	---	---	---
CrC*, CrD*:											
Charlton--------	0-5	Very stony fine sandy loam.	SM, ML	A-2, A-4	10-20	75-95	70-90	60-85	30-70	<25	NP-5
	5-25	Fine sandy loam, sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-80	20-65	<25	NP-3
	25-60	Fine sandy loam, sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	40-75	20-50	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CrC*, CrD*:											
Hollis	0-2	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-15	75-100	65-95	40-85	25-70	<20	NP-3
	2-14	Fine sandy loam, sandy loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	0-15	75-95	65-95	40-80	20-65	---	NP
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
GbB, GbC	0-4	Very stony sandy loam.	SM, SW-SM	A-1, A-2, A-4	10-20	70-95	60-90	30-75	10-45	<20	NP
Gloucester	4-12	Gravelly sandy loam, sandy loam, fine sandy loam.	SM, SW-SM	A-1, A-2, A-4	5-30	60-75	40-75	20-50	10-40	<10	NP
	12-60	Gravelly loamy coarse sand, gravelly loamy sand, gravelly sandy loam.	SM, SW-SM, GM, GW-GM	A-1, A-2, A-3	15-40	40-70	20-60	10-40	5-25	<10	NP
GeC, GeD	0-4	Extremely stony sandy loam.	SM, SW-SM	A-1, A-2, A-4	15-35	60-90	55-90	25-75	10-45	<20	NP
Gloucester	4-12	Gravelly sandy loam, sandy loam, fine sandy loam.	SM, SW-SM	A-1, A-2, A-4	5-30	60-75	40-75	20-50	10-40	<10	NP
	12-60	Gravelly loamy coarse sand, gravelly loamy sand, gravelly sandy loam.	SM, SW-SM, GM, GW-GM	A-1, A-2, A-3	15-40	40-70	20-60	10-40	5-25	<10	NP
HkA, HkC, HkD	0-8	Gravelly sandy loam.	SM, SP-SM	A-1, A-2, A-3, A-4	0-10	60-95	40-75	20-70	2-40	<20	NP
Hinckley	8-18	Gravelly loamy sand, loamy fine sand, very gravelly loamy coarse sand.	SM, GM, GP-GM, SP-SM	A-1, A-2, A-3	0-20	50-95	30-85	15-70	2-30	<20	NP
	18-60	Stratified very gravelly loamy fine sand to cobbly coarse sand.	SP, SP-SM, GP, GP-GM	A-1, A-2	5-30	20-65	20-50	10-40	0-20	<10	NP
HrC*, HrD*:											
Hollis	0-2	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-15	75-100	65-95	40-85	25-70	<20	NP-3
	2-14	Fine sandy loam, sandy loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	0-15	75-95	65-95	40-80	20-65	---	NP
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Charlton	0-5	Very stony fine sandy loam.	SM, ML	A-2, A-4	10-20	75-95	70-90	60-85	30-70	<25	NP-5
	5-25	Fine sandy loam, sandy loam, gravelly loam.	SM, ML	A-2, A-4	5-15	65-90	60-90	50-80	20-65	<25	NP-3
	25-60	Fine sandy loam, sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	60-90	60-85	40-75	20-50	---	NP
Rock outcrop.											

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
MyA, MyB--------- Merrimac	0-8	Sandy loam--------	SM, ML	A-2, A-4	0	85-95	70-90	40-85	20-55	<20	NP
	8-20	Sandy loam--------	SM	A-2	0	75-95	70-90	40-60	20-35	<25	NP
	20-24	Gravelly loamy sand, sandy loam, loamy sand.	SP, SM, SP-SM	A-1, A-2, A-3	0	65-95	55-90	30-60	0-35	<25	NP
	24-60	Stratified sand to very gravelly coarse sand.	GP, SP, SP-SM, GP-GM	A-1	5-25	40-65	30-60	15-40	0-10	---	NP
Nn--------------- Ninigret	0-8	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	70-95	40-65	<25	NP-3
	8-25	Fine sandy loam, sandy loam.	SM	A-2, A-4	0	95-100	90-100	65-85	20-50	<25	NP-3
	25-60	Loamy sand, sand, gravelly sand.	SP, SM, GP	A-1, A-2, A-3	0-20	45-100	30-90	25-65	0-30	---	NP
On--------------- Occum	0-8	Fine sandy loam	SM, ML	A-2, A-4	0	95-100	70-100	45-80	25-55	<25	NP-3
	8-35	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	95-100	70-100	45-80	25-50	<25	NP-3
	35-60	Stratified loamy fine sand to very gravelly coarse sand.	SM, SP-SM	A-1, A-2	0-5	65-100	40-100	25-65	5-25	---	NP
PbB, PbC, PbD---- Paxton	0-7	Fine sandy loam	SM, ML, SM-SC	A-2, A-4	0-10	80-95	75-90	60-85	30-65	<30	NP-10
	7-25	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	0-15	70-90	65-90	50-85	25-65	<30	NP-10
	25-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	0-15	70-90	60-85	50-75	20-60	<30	NP-10
PdB, PdC--------- Paxton	0-7	Very stony fine sandy loam.	SM, ML, SM-SC	A-2, A-4	5-20	80-95	75-90	60-85	30-65	<30	NP-10
	7-25	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	5-20	70-90	65-90	50-85	25-65	<30	NP-10
	25-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	5-15	70-90	60-85	50-75	20-60	<30	NP-10
PeC, PeD--------- Paxton	0-7	Extremely stony fine sandy loam.	SM, ML, SM-SC	A-2, A-4	10-25	80-90	70-85	60-80	30-65	<30	NP-10
	7-25	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	5-20	70-90	65-90	50-85	25-65	<30	NP-10
	25-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SM-SC	A-2, A-4	5-15	70-90	60-85	50-75	20-60	<30	NP-10
Pr*. Pits											
Ps--------------- Pootatuck	0-5	Fine sandy loam	SM, ML	A-2, A-4	0	95-100	80-100	55-95	30-75	<25	NP-4
	5-27	Sandy loam, fine sandy loam.	SM	A-2, A-4	0	95-100	80-100	55-85	30-50	<20	NP-2
	27-60	Sand, loamy sand, gravelly sand.	SP-SM, SM	A-1, A-2	0	70-100	50-100	30-45	5-20	---	NP
Rd--------------- Ridgebury	0-8	Fine sandy loam	SM, ML	A-1, A-2, A-4	0-5	80-100	75-90	40-90	20-70	---	NP
	8-16	Sandy loam, fine sandy loam, gravelly loam.	SM, ML	A-1, A-2, A-4	0-15	65-95	55-90	40-80	20-60	---	NP
	16-60	Sandy loam, gravelly loam, fine sandy loam.	SM, ML	A-1, A-2, A-4	0-15	65-95	55-90	35-80	20-60	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Rn*:											
Ridgebury	0-8	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	10-30	70-100	50-85	30-80	15-65	---	NP
	8-16	Sandy loam, fine sandy loam, gravelly loam.	SM, ML	A-1, A-2, A-4	0-15	65-95	55-90	40-80	20-60	---	NP
	16-60	Sandy loam, gravelly loam, fine sandy loam.	SM, ML	A-1, A-2, A-4	0-15	65-95	55-90	35-80	20-60	---	NP
Leicester	0-7	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	5-25	70-95	70-90	45-85	25-70	<25	NP-5
	7-30	Fine sandy loam, gravelly fine sandy loam, gravelly sandy loam.	SM, ML	A-2, A-4	5-10	70-90	60-85	40-75	20-55	---	NP
	30-60	Fine sandy loam, gravelly fine sandy loam, sandy loam.	SM, GM	A-2, A-4	5-15	65-90	55-85	35-70	20-45	---	NP
Whitman	0-9	Extremely stony fine sandy loam.	ML, SM, CL-ML	A-1, A-2, A-4	10-40	65-80	60-75	35-70	20-65	16-35	NP-10
	9-14	Sandy loam, fine sandy loam, loam.	ML, SM, CL-ML	A-1, A-2, A-4	0-10	65-95	60-90	35-85	20-60	16-35	NP-10
	14-60	Sandy loam, fine sandy loam, loam.	ML, SM, CL-ML	A-1, A-2, A-4	0-10	65-95	60-90	35-85	20-60	16-32	NP-8
Ru	0-7	Fine sandy loam	SM, ML	A-2, A-4	0	95-100	80-100	55-95	30-75	<25	NP-4
Rippowam	7-35	Fine sandy loam, sandy loam.	SM	A-2, A-4	0	95-100	80-100	55-85	30-50	<20	NP-2
	35-60	Loamy sand, coarse sand, gravelly sand.	SP-SM, SM	A-1, A-2	0	70-100	50-100	30-45	5-20	---	NP
Sb	0-14	Silt loam	ML, OL	A-4	0	100	100	95-100	70-95	<40	NP-10
Saco	14-41	Silt loam, very fine sandy loam.	ML	A-4	0	100	100	95-100	70-95	<40	NP-10
	41-60	Stratified fine sand to gravelly coarse sand.	SP, SM, SP-SM	A-1, A-2, A-3	0	80-100	35-100	10-70	0-20	---	NP
Sf	4-0	Muck	Pt	A-8	---	---	---	---	---	---	---
Scarboro	0-14	Loamy sand, sandy loam, fine sandy loam.	SM, SP-SM	A-1, A-2, A-3, A-4	0	95-100	85-100	45-85	5-50	---	NP
	14-26	Loamy sand, fine sand, sand.	SM, SP-SM	A-1, A-2, A-3	0	95-100	85-100	45-80	5-35	---	NP
	26-60	Loamy sand, sand, coarse sand.	SM, SP-SM, SP	A-1, A-2, A-3	0	95-100	70-100	30-80	2-35	---	NP
Sg	0-10	Sandy loam	SM, ML	A-2, A-4, A-1	0-5	85-100	70-100	40-90	20-55	---	NP
Sudbury	10-22	Sandy loam, fine sandy loam, gravelly sandy loam.	SM	A-2, A-4, A-1	0-5	85-100	60-100	40-80	20-50	---	NP
	22-28	Gravelly loamy sand, loamy sand, sandy loam.	SM, SP-SM	A-1, A-2, A-3	0-5	70-100	60-100	30-70	5-35	---	NP
	28-60	Stratified sand and gravel.	SP, SP-SM, GP, GP-GM	A-1	10-40	35-70	25-65	15-45	0-10	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
St---------- Suncook	0-9	Loamy fine sand	SM	A-2	0	95-100	85-100	65-70	15-35	---	NP
	9-60	Stratified loamy fine sand to coarse sand.	SP, SM	A-2, A-3	0	90-100	70-100	20-80	0-35	---	NP
SvA, SvB--------- Sutton	0-5	Fine sandy loam	SM, ML	A-2, A-4	0-10	75-95	65-90	60-80	30-70	<25	NP-3
	5-35	Fine sandy loam, sandy loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	0-10	75-95	65-90	50-80	25-65	<25	NP-3
	35-60	Fine sandy loam, gravelly sandy loam, sandy loam.	SM	A-2, A-4	5-15	60-90	55-85	45-70	20-45	---	NP
SwA, SwB--------- Sutton	0-5	Very stony fine sandy loam.	SM, ML	A-2, A-4	5-20	75-95	65-90	60-80	30-70	<25	NP-3
	5-35	Fine sandy loam, sandy loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	5-15	75-95	65-90	50-80	25-65	<25	NP-3
	35-60	Fine sandy loam, gravelly sandy loam, sandy loam.	SM	A-2, A-4	5-15	60-90	55-85	45-70	20-45	---	NP
SxB---------- Sutton	0-5	Extremely stony fine sandy loam.	SM, ML	A-2, A-4	5-20	75-95	65-90	60-80	30-70	<25	NP-3
	5-35	Fine sandy loam, sandy loam, gravelly fine sandy loam.	SM, ML	A-2, A-4	5-15	75-95	65-90	50-80	25-65	<25	NP-3
	35-60	Fine sandy loam, gravelly sandy loam, sandy loam.	SM	A-2, A-4	5-15	60-90	55-85	45-70	20-45	---	NP
Ud*. Udorthents											
Wd---------- Walpole	0-6	Sandy loam-------	SM	A-2, A-4	0-5	90-100	85-100	70-100	30-50	<25	NP-3
	6-23	Fine sandy loam, sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-5	85-100	60-100	40-95	25-50	---	NP
	23-60	Gravelly loamy sand, gravelly sand, coarse sand.	SP, SM	A-1, A-2, A-3	0-20	55-100	50-100	25-90	0-25	---	NP
WvA, WvB--------- Windsor	0-7	Loamy sand-------	SM	A-2, A-1	0	95-100	85-100	35-85	20-35	---	NP
	7-32	Loamy sand, loamy fine sand, sand.	SW-SM, SM, SP-SM	A-2, A-1	0	95-100	85-100	45-95	10-30	---	NP
	32-60	Sand, fine sand	SP-SM, SM	A-2, A-3, A-1	0	90-100	75-100	40-95	5-20	---	NP
WxA, WxB, WxC---- Woodbridge	0-8	Fine sandy loam	SM, ML, SM-SC	A-2, A-4	0-10	85-95	70-90	60-85	30-65	<30	NP-10
	8-30	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML, SM-SC	A-2, A-4	0-15	75-90	65-90	50-85	25-65	<30	NP-10
	30-60	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML, SM-SC	A-2, A-4	5-15	70-90	60-85	50-75	20-60	<30	NP-10

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
WyA, WyB, WyC---- Woodbridge	0-8	Very stony fine sandy loam.	SM, ML, SM-SC	A-2, A-4	5-20	85-95	70-90	60-85	30-65	<30	NP-10
	8-30	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML, SM-SC	A-2, A-4	5-15	75-95	65-90	50-85	25-60	<30	NP-10
	30-60	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML, SM-SC	A-2, A-4	5-15	70-90	60-90	50-75	25-60	<30	NP-10
WzA, WzC--------- Woodbridge	0-8	Extremely stony fine sandy loam.	SM, ML, SM-SC	A-2, A-4	10-25	85-95	70-90	60-85	30-65	<30	NP-10
	8-30	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML, SM-SC	A-2, A-4	5-15	75-95	65-90	50-85	25-60	<30	NP-10
	30-60	Fine sandy loam, loam, gravelly fine sandy loam.	SM, ML, SM-SC	A-2, A-4	5-15	70-90	60-90	50-75	25-60	<30	NP-10

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
Aa*:										
Adrian	0-33	---	0.30-0.55	0.2-6.0	0.35-0.45	5.1-7.8	---	---	---	55-75
	33-60	2-10	1.40-1.75	6.0-20	0.03-0.08	5.6-8.4	Low	---		
Palms	0-30	---	0.25-0.45	0.2-6.0	0.35-0.45	5.1-7.8	---	---	---	>75
	30-60	7-35	1.45-1.75	0.2-2.0	0.14-0.22	6.1-8.4	Low	---		
AfA, AfB	0-10	4-10	1.10-1.20	2.0-6.0	0.13-0.25	4.5-6.5	Low	0.28	3	1-5
Agawam	10-30	1-10	1.20-1.40	2.0-6.0	0.11-0.21	4.5-6.5	Low	0.37		
	30-40	1-2	1.30-1.40	6.0-20	0.01-0.09	4.5-6.5	Low	0.17		
	40-60	<1	1.30-1.50	6.0-20	0.01-0.09	4.5-6.5	Low	0.10		
BkC*, BkD*:										
Brookfield	0-13	2-8	1.00-1.25	0.6-6.0	0.08-0.18	4.5-6.0	Low	0.20	3	---
	13-29	2-8	1.35-1.60	0.6-6.0	0.06-0.18	4.5-6.0	Low	0.32		
	29-60	1-6	1.40-1.65	0.6-6.0	0.05-0.14	4.5-6.0	Low	0.24		
Brimfield	0-1	3-10	1.10-1.35	0.6-6.0	0.10-0.20	4.5-6.0	Low	0.17	2	---
	1-18	3-10	1.30-1.55	0.6-6.0	0.08-0.19	4.5-6.0	Low	0.32		
	18	---	---	---	---	---	---	---		
CbB*, CbC*:										
Canton	0-2	1-8	0.90-1.20	2.0-6.0	0.13-0.20	3.6-6.0	Low	0.24	3	1-6
	2-23	1-8	1.20-1.50	2.0-6.0	0.13-0.20	3.6-6.0	Low	0.37		
	23-60	1-5	1.30-1.50	6.0-20	0.04-0.08	3.6-6.0	Low	0.17		
Charlton	0-5	3-8	1.00-1.25	0.6-6.0	0.08-0.23	4.5-6.0	Low	0.24	3	2-5
	5-25	3-8	1.40-1.65	0.6-6.0	0.05-0.20	4.5-6.0	Low	0.32		
	25-60	1-8	1.45-1.70	0.6-6.0	0.05-0.16	4.5-6.0	Low	0.24		
CcB*, CcC*:										
Canton	0-2	1-8	0.90-1.20	2.0-6.0	0.13-0.20	3.6-6.0	Low	0.24	3	---
	2-23	1-8	1.20-1.50	2.0-6.0	0.13-0.20	3.6-6.0	Low	0.37		
	23-60	1-5	1.30-1.60	6.0-20	0.04-0.08	3.6-6.0	Low	0.17		
Charlton	0-5	3-8	1.00-1.25	0.6-6.0	0.08-0.23	4.5-6.0	Low	0.20	3	2-5
	5-25	3-8	1.40-1.65	0.6-6.0	0.05-0.20	4.5-6.0	Low	0.32		
	25-60	1-8	1.45-1.70	0.6-6.0	0.05-0.16	4.5-6.0	Low	0.24		
CdC*, CdD*:										
Canton	0-2	1-8	0.90-1.20	2.0-6.0	0.13-0.17	3.6-6.0	Low	0.24	3	---
	2-23	1-8	1.20-1.50	2.0-6.0	0.13-0.20	3.6-6.0	Low	0.37		
	23-60	1-5	1.30-1.60	6.0-20	0.04-0.08	3.6-6.0	Low	0.17		
Charlton	0-5	3-8	1.00-1.25	0.6-6.0	0.05-0.15	4.5-6.0	Low	0.20	3	2-5
	5-25	3-8	1.40-1.65	0.6-6.0	0.05-0.20	4.5-6.0	Low	0.32		
	25-60	1-8	1.45-1.70	0.6-6.0	0.05-0.16	4.5-6.0	Low	0.24		
Ce	0-60	---	0.13-0.23	0.2-6.0	0.35-0.45	4.5-7.3	---	---	---	>70
Carlisle										
CrC*, CrD*:										
Charlton	0-5	3-8	1.00-1.25	0.6-6.0	0.08-0.23	4.5-6.0	Low	0.20	3	2-5
	5-25	3-8	1.40-1.65	0.6-6.0	0.05-0.20	4.5-6.0	Low	0.32		
	25-60	1-8	1.45-1.70	0.6-6.0	0.05-0.16	4.5-6.0	Low	0.24		
Hollis	0-2	3-10	1.10-1.40	0.6-6.0	0.10-0.21	4.5-6.0	Low	0.17	2	2-5
	2-14	1-8	1.30-1.55	0.6-6.0	0.06-0.18	4.5-6.0	Low	0.32		
	14	---	---	---	---	---	---	---		
GbB, GbC	0-4	1-8	1.00-1.30	6.0-20	0.07-0.16	3.6-6.0	Low	0.17	3	---
Gloucester	4-12	1-8	1.20-1.50	6.0-20	0.06-0.10	3.6-6.0	Low	0.17		
	12-60	0-5	1.50-1.75	6.0-20	0.03-0.08	3.6-6.0	Low	0.17		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
GeC, GeD--------- Gloucester	0-4 4-12 12-60	1-8 1-8 0-5	1.00-1.30 1.20-1.50 1.50-1.75	6.0-20 6.0-20 6.0-20	0.07-0.16 0.06-0.10 0.03-0.08	3.6-6.0 3.6-6.0 3.6-6.0	Low---------- Low---------- Low----------	0.17 0.17 0.17	3	---
HkA, HkC, HkD---- Hinckley	0-8 8-18 18-60	4-8 1-5 0-3	1.00-1.20 1.20-1.40 1.30-1.50	6.0-20 6.0-20 >20	0.03-0.18 0.01-0.10 0.01-0.06	3.6-6.0 3.6-6.0 3.6-6.0	Low---------- Low---------- Low----------	0.17 0.17 0.10	3	2-7
HrC*, HrD*: Hollis---------- Charlton-------- Rock outcrop.	0-2 2-14 14 0-5 5-25 25-60	3-10 1-8 --- 3-8 3-8 1-8	1.10-1.40 1.30-1.55 --- 1.00-1.25 1.40-1.65 1.45-1.70	0.6-6.0 0.6-6.0 --- 0.6-6.0 0.6-6.0 0.6-6.0	0.10-0.21 0.06-0.18 --- 0.08-0.23 0.05-0.20 0.05-0.16	4.5-6.0 4.5-6.0 --- 4.5-6.0 4.5-6.0 4.5-6.0	Low---------- Low---------- ---------- Low---------- Low---------- Low----------	0.17 0.32 ---- 0.20 0.32 0.24	2 3	2-5 2-5
MyA, MyB--------- Merrimac	0-8 8-20 20-24 24-60	3-7 1-4 1-3 0-3	1.10-1.20 1.20-1.40 1.20-1.40 1.30-1.50	2.0-6.0 2.0-6.0 2.0-20.0 6.0-20	0.14-0.19 0.14-0.17 0.03-0.12 0.01-0.06	3.6-6.0 3.6-6.0 3.6-6.0 3.6-6.0	Low---------- Low---------- Low---------- Low----------	0.24 0.24 0.17 0.10	3	1-5
Nn--------------- Ninigret	0-8 8-25 25-60	3-7 3-7 0-2	1.00-1.25 1.35-1.60 1.45-1.70	2.0-6.0 2.0-6.0 6.0-20	0.13-0.25 0.06-0.18 0.01-0.13	4.5-6.0 4.5-6.0 4.5-6.0	Low---------- Low---------- Low----------	0.28 0.32 0.10	3	2-8
On--------------- Occum	0-8 8-35 35-60	2-6 2-6 0-2	1.05-1.30 1.20-1.45 1.30-1.55	2.0-6.0 2.0-6.0 >6.0	0.11-0.24 0.10-0.22 0.01-0.13	4.5-6.5 4.5-6.5 4.5-6.5	Low---------- Low---------- Low----------	0.20 0.20 0.17	5	2-6
PbB, PbC, PbD---- Paxton	0-7 7-25 25-60	3-12 3-12 3-12	1.00-1.25 1.35-1.60 1.70-2.00	0.6-2.0 0.6-2.0 <0.2	0.08-0.23 0.06-0.20 0.05-0.12	4.5-6.5 4.5-6.5 4.5-6.5	Low---------- Low---------- Low----------	0.24 0.32 0.24	3	2-5
PdB, PdC--------- Paxton	0-7 7-25 25-60	3-12 3-12 3-12	1.00-1.25 1.35-1.60 1.70-2.00	0.6-6.0 0.6-6.0 <0.2	0.08-0.23 0.06-0.20 0.05-0.12	4.5-6.5 4.5-6.5 4.5-6.5	Low---------- Low---------- Low----------	0.20 0.32 0.24	3	2-5
PeC, PeD--------- Paxton	0-7 7-25 25-60	3-12 3-12 3-12	1.00-1.25 1.35-1.60 1.70-2.00	0.6-6.0 0.6-6.0 <0.2	0.05-0.15 0.06-0.20 0.05-0.12	4.5-6.5 4.5-6.5 4.5-6.5	Low---------- Low---------- Low----------	0.20 0.32 0.24	3	2-5
Pr*. Pits										
Ps--------------- Pootatuck	0-5 5-27 27-60	2-6 1-6 0-2	1.10-1.35 1.20-1.45 1.25-1.50	0.6-6.0 0.6-6.0 >6.0	0.11-0.24 0.09-0.18 0.01-0.13	4.5-6.5 4.5-6.5 4.5-6.5	Low---------- Low---------- Low----------	0.20 0.20 0.17	3	2-6
Rd--------------- Ridgebury	0-8 8-16 16-60	3-10 2-8 2-8	1.00-1.30 1.60-1.90 1.80-2.00	0.6-6.0 0.6-6.0 <0.2	0.06-0.24 0.04-0.20 0.01-0.05	4.5-6.0 4.5-6.0 4.5-6.0	Low---------- Low---------- Low----------	0.24 0.32 0.24	3	4-7
Rn*: Ridgebury------- Leicester------- Whitman--------- 	0-8 8-16 16-60 0-7 7-30 30-60 0-9 9-14 14-60	3-10 2-8 2-8 3-10 3-10 2-7 5-8 2-4 1-3	1.00-1.30 1.60-1.90 1.80-2.00 1.00-1.25 1.35-1.60 1.45-1.70 1.10-1.30 1.60-1.85 1.85-2.00	0.6-6.0 0.6-6.0 <0.2 0.6-6.0 0.6-6.0 0.6-6.0 0.6-6.0 0.6-6.0 <0.2	0.06-0.21 0.04-0.20 0.01-0.05 0.06-0.28 0.05-0.16 0.04-0.16 0.12-0.26 0.10-0.17 0.03-0.04	4.5-6.0 4.5-6.0 4.5-6.0 4.5-6.0 4.5-6.0 4.5-6.0 4.5-6.5 4.5-6.5 4.5-6.5	Low---------- Low---------- Low---------- Low---------- Low---------- Low---------- Low---------- Low---------- Low----------	0.20 0.32 0.24 0.20 0.32 0.24 0.20 0.32 0.24	3 3 3 	--- 3-8 ---

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
Ru----------	0-7	2-6	1.10-1.35	0.6-6.0	0.11-0.24	4.5-6.5	Low----------	0.20	3	3-8
Rippowam	7-35	1-6	1.20-1.45	0.6-6.0	0.09-0.18	4.5-6.5	Low----------	0.20		
	35-60	0-2	1.25-1.50	>6.0	0.01-0.13	4.5-6.5	Low----------	0.17		
Sb----------	0-14	4-10	1.00-1.40	0.6-2.0	0.17-0.30	5.1-6.5	Low----------	0.49	5	3-20
Saco	14-41	2-10	1.20-1.50	0.6-2.0	0.15-0.26	5.1-6.5	Low----------	0.64		
	41-60	1-8	1.30-1.60	>6.0	0.01-0.13	5.6-7.3	Low----------	0.10		
Sf----------	4-0	---	0.55-0.75	6.0-20.0	0.20-0.45	4.5-6.0	Low----------	----	5	---
Scarboro	0-14	1-7	1.00-1.20	>6.0	0.05-0.20	4.5-6.0	Low----------	0.17		
	14-26	1-5	1.15-1.35	>6.0	0.04-0.13	4.5-6.0	Low----------	0.17		
	26-60	0-2	1.35-1.55	>6.0	0.02-0.13	4.5-6.0	Low----------	0.10		
Sg----------	0-10	2-6	1.10-1.40	2.0-6.0	0.10-0.25	3.6-6.0	Low----------	0.24	3	2-6
Sudbury	10-22	2-7	1.15-1.45	2.0-6.0	0.07-0.18	3.6-6.0	Low----------	0.24		
	22-28	0-4	1.25-1.45	2.0-20	0.01-0.15	3.6-6.0	Low----------	0.17		
	28-60	0-3	1.30-1.45	6.0-20	0.01-0.06	3.6-6.0	Low----------	0.10		
St----------	0-9	1-3	1.10-1.30	>6.0	0.07-0.15	4.5-6.5	Low----------	0.12	5	2-5
Suncook	9-60	0-3	1.20-1.50	>6.0	0.01-0.13	4.5-6.5	Low----------	0.17		
SvA, SvB----------	0-5	3-10	1.00-1.25	0.6-6.0	0.09-0.25	4.5-6.0	Low----------	0.20	3	2-7
Sutton	5-35	3-10	1.35-1.60	0.6-6.0	0.07-0.20	4.5-6.0	Low----------	0.43		
	35-60	2-6	1.45-1.70	0.6-6.0	0.04-0.16	4.5-6.5	Low----------	0.43		
SwA, SwB----------	0-5	3-10	1.00-1.25	0.6-6.0	0.09-0.23	4.5-6.0	Low----------	0.20	3	2-7
Sutton	5-35	3-10	1.35-1.60	0.6-6.0	0.04-0.16	4.5-6.5	Low----------	0.43		
	35-60	2-6	1.45-1.70	0.6-6.0	0.04-0.16	4.5-6.5	Low----------	0.43		
SxB----------	0-5	3-10	1.00-1.25	0.6-6.0	0.09-0.23	4.5-6.0	Low----------	0.20	3	---
Sutton	5-35	3-10	1.35-1.60	0.6-6.0	0.04-0.16	4.5-6.5	Low----------	0.43		
	35-60	2-6	1.45-1.70	0.6-6.0	0.04-0.16	4.5-6.5	Low----------	0.43		
Ud*.										
Udorthents										
Wd----------	0-6	2-6	1.00-1.25	2.0-6.0	0.10-0.23	4.5-6.0	Low----------	0.20	3	2-8
Walpole	6-23	2-6	1.30-1.55	2.0-6.0	0.07-0.18	4.5-6.0	Low----------	0.24		
	23-60	0-2	1.40-1.65	>6.0	0.01-0.13	4.5-6.0	Low----------	0.10		
WvA, WvB----------	0-7	1-3	1.00-1.20	>6.0	0.08-0.12	4.5-6.0	Low----------	0.17	5	2-4
Windsor	7-32	0-3	1.30-1.55	>6.0	0.02-0.12	4.5-6.0	Low----------	0.17		
	32-60	0-2	1.40-1.65	>6.0	0.01-0.08	4.5-6.5	Low----------	0.17		
WxA, WxB, WxC, WyA, WyB, WyC, WzA, WzC---------	0-8	3-12	1.00-1.25	0.6-2.0	0.08-0.23	4.5-6.0	Low----------	0.24	3	2-6
Woodbridge	8-30	3-12	1.35-1.60	0.6-2.0	0.06-0.20	4.5-6.0	Low----------	0.32		
	30-60	3-12	1.70-2.00	<0.2	0.05-0.12	4.5-6.5	Low----------	0.24		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock	Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth		Uncoated steel	Concrete
					Ft			In			
Aa*:											
Adrian	A/D	Frequent	Long	Nov-May	+1-1.0	Apparent	Nov-May	>60	High	High	Moderate.
Palms	A/D	Frequent	Long	Nov-May	+1-1.0	Apparent	Nov-May	>60	High	High	Moderate.
AfA, AfB Agawam	B	None	---	---	>6.0	---	---	>60	Low	Low	High.
BkC, BkD:											
Brookfield	B	None	---	---	>6.0	---	---	>60	Moderate	Low	High.
Brimfield	C/D	None	---	---	>6.0	---	---	10-20	Moderate	Low	High.
CbB, CbC, CcB, CcC, CdC, CdD: Canton	B	None	---	---	>6.0	---	---	>60	Low	Low	High.
Charlton	B	None	---	---	>6.0	---	---	>60	Low	Low	High.
Ce* Carlisle	A/D	Frequent	Long	Nov-May	+1-1.0	Apparent	Sep-Jun	>60	High	High	Low.
CrC, CrD:											
Charlton	B	None	---	---	>6.0	---	---	>60	Low	Low	High.
Hollis	C/D	None	---	---	>6.0	---	---	10-20	Moderate	Low	High.
GbB, GbC, GeC, GeD Gloucester	A	None	---	---	>6.0	---	---	>60	Low	Low	High.
HkA, HkC, HkD Hinckley	A	None	---	---	>6.0	---	---	>60	Low	Low	High.
HrC, HrD:											
Hollis	C/D	None	---	---	>6.0	---	---	10-20	Moderate	Low	High.
Charlton	B	None	---	---	>6.0	---	---	>60	Low	Low	High.
Rock outcrop.											
MyA, MyB Merrimac	A	None	---	---	>6.0	---	---	>60	Low	Low	High.
Nn Ninigret	B	None	---	---	1.5-3.0	Apparent	Nov-Apr	>60	Moderate	Low	High.
On Occum	B	Frequent	Brief	Nov-Apr	4.0-1.0	Apparent	Nov-Apr	>60	Moderate	Low	Moderate.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock	Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth		Uncoated steel	Concrete
					Ft			In			
PbB, PbC, PbD, PdB, PdC, PeC, PeD---------- Paxton	C	None--------	---	---	1.5-3.0	Perched	Feb-Mar	>60	Moderate----	Low------	Moderate.
Pr. Pits											
Ps---------- Pootatuck	B	Frequent----	Brief-----	Nov-Apr	1.5-3.0	Apparent	Nov-Apr	>60	Moderate----	Moderate	Moderate.
Rd---------- Ridgebury	C	None--------	---	---	0-1.5	Perched	Nov-May	>60	High--------	High-----	High.
Rn:											
Ridgebury--------	C	None--------	---	---	0-1.5	Perched	Nov-May	>60	High--------	High-----	High.
Leicester--------	C	None--------	---	---	0-1.5	Apparent	Nov-May	>60	High--------	Low------	High.
Whitman*---------	D	None--------	---	---	+1-0.5	Perched	Sep-Jun	>60	High--------	High-----	High.
Ru---------- Rippowam	C	Frequent----	Brief-----	Nov-Apr	0-1.5	Apparent	Nov-May	>60	High--------	High-----	High.
Sb---------- Saco	D	Frequent----	Brief-----	Nov-May	0-0.5	Apparent	Sep-Jun	>60	High--------	Low------	Moderate.
Sf*---------- Scarboro	D	None--------	---	---	+1-1.0	Apparent	Jan-Dec	>60	High--------	High-----	High.
Sg---------- Sudbury	B	None--------	---	---	1.5-3.0	Apparent	Dec-Apr	>60	Moderate----	Low------	High.
St---------- Suncook	A	Common------	Brief-----	Mar-May	3.0-6.0	Apparent	Jan-Apr	>60	Low---------	Low------	High.
SvA, SvB, SwA, SwB, SxB--------- Sutton	B	None--------	---	---	1.5-3.5	Apparent	Nov-Apr	>60	Moderate----	Low------	High.
Ud. Udorthents											
Wd---------- Walpole	C	None--------	---	---	0-1.0	Apparent	Nov-Apr	>60	High--------	Low------	High.
WvA, WvB---------- Windsor	A	None--------	---	---	>6.0	---	---	>60	Low---------	Low------	High.
WxA, WxB, WxC, WyA, WyB, WyC, WzA, WzC--------- Woodbridge	C	None--------	---	---	1.5-3.0	Perched	Nov-May	>60	High--------	Low------	Moderate.

* In the "High water table--Depth" column, a plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

TABLE 17.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Adrian	Sandy or sandy-skeletal, mixed, euic, mesic Terric Medisaprists
Agawam	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts
Brimfield	Loamy, mixed, mesic Lithic Dystrochrepts
Brookfield	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Canton	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts
Carlisle	Euic, mesic Typic Medisaprists
Charlton	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Gloucester	Sandy-skeletal, mixed, mesic Typic Dystrochrepts
Hinckley	Sandy-skeletal, mixed, mesic Typic Udorthents
Hollis	Loamy, mixed, mesic Lithic Dystrochrepts
Leicester	Coarse-loamy, mixed, acid, mesic Aeric Haplaquepts
Merrimac	Sandy, mixed, mesic Typic Dystrochrepts
Ninigret	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Dystrochrepts
Occum	Coarse-loamy, mixed, mesic Fluventic Dystrochrepts
Palms	Loamy, mixed, euic, mesic Terric Medisaprists
Paxton	Coarse-loamy, mixed, mesic Typic Fragiochrepts
Pootatuck	Coarse-loamy, mixed, mesic Fluvaquentic Dystrochrepts
Ridgebury	Coarse-loamy, mixed, mesic Aeric Fragiaquepts
Rippowam	Coarse-loamy, mixed, nonacid, mesic Aeric Fluvaquents
Saco	Coarse-silty, mixed, nonacid, mesic Fluvaquentic Humaquepts
Scarboro	Sandy, mixed, mesic Histic Humaquepts
Sudbury	Sandy, mixed, mesic Aquic Dystrochrepts
Suncook	Mixed, mesic Typic Udipsamments
Sutton	Coarse-loamy, mixed, mesic Aquic Dystrochrepts
Udorthents	Udorthents
Walpole	Sandy, mixed, mesic Aeric Haplaquepts
Whitman	Coarse-loamy, mixed, mesic Humic Fragiaquepts
Windsor	Mixed, mesic Typic Udipsamments
Woodbridge	Coarse-loamy, mixed, mesic Typic Fragiochrepts

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U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

CONNECTICUT AGRICULTURAL EXPERIMENT STATION
STORRS AGRICULTURAL EXPERIMENT STATION

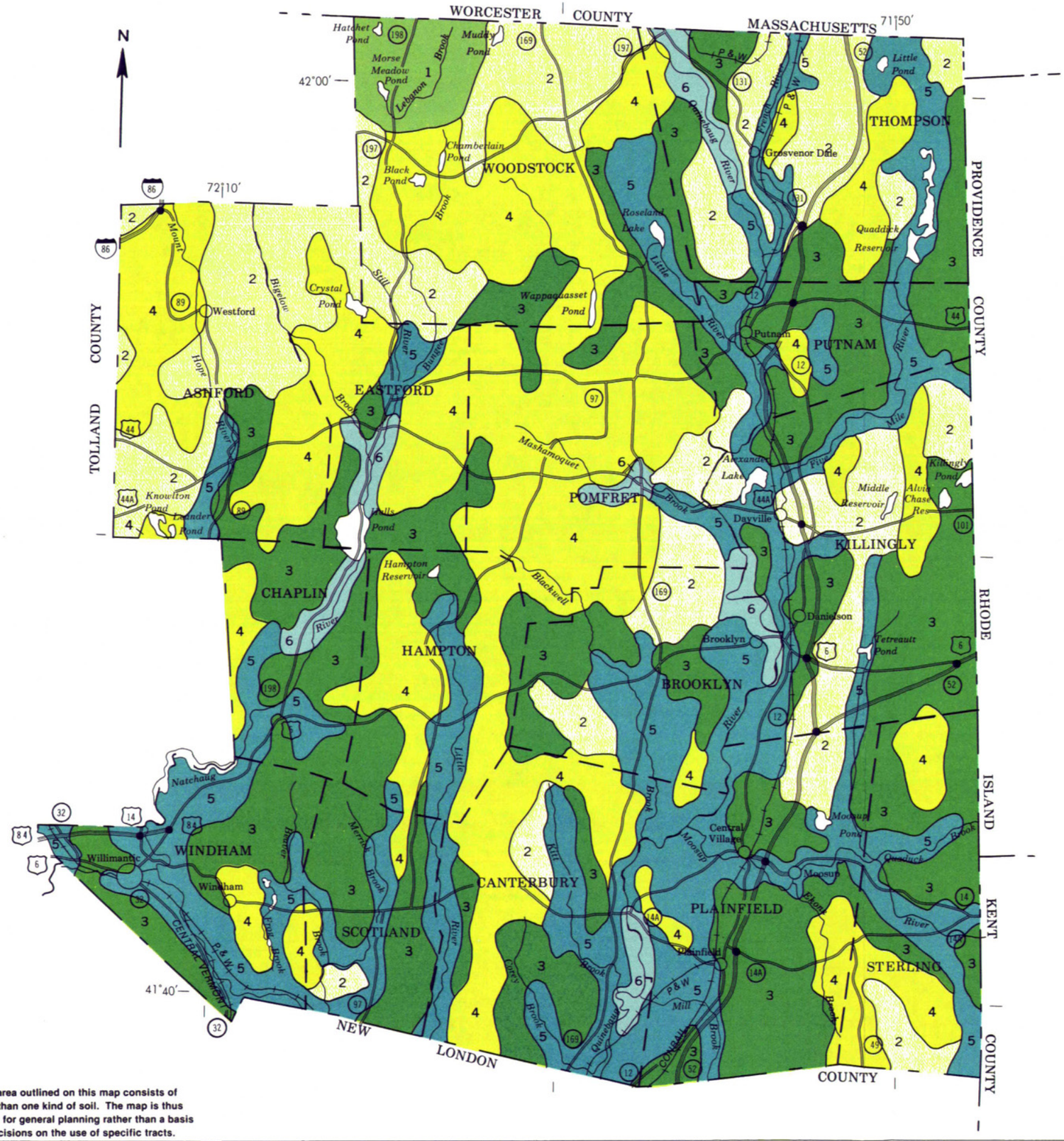
GENERAL SOIL MAP

WINDHAM COUNTY, CONNECTICUT

Scale 1:190,080

1 0 1 2 3 4 Miles

1 0 1 2 3 4 Kilometers



Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

LEGEND

1 Brookfield-Brimfield: Gently sloping to steep, well drained and somewhat excessively drained, loamy soils on glacial till uplands

2 Charlton-Hollis: Gently sloping to steep, well drained and somewhat excessively drained, loamy soils on glacial till uplands

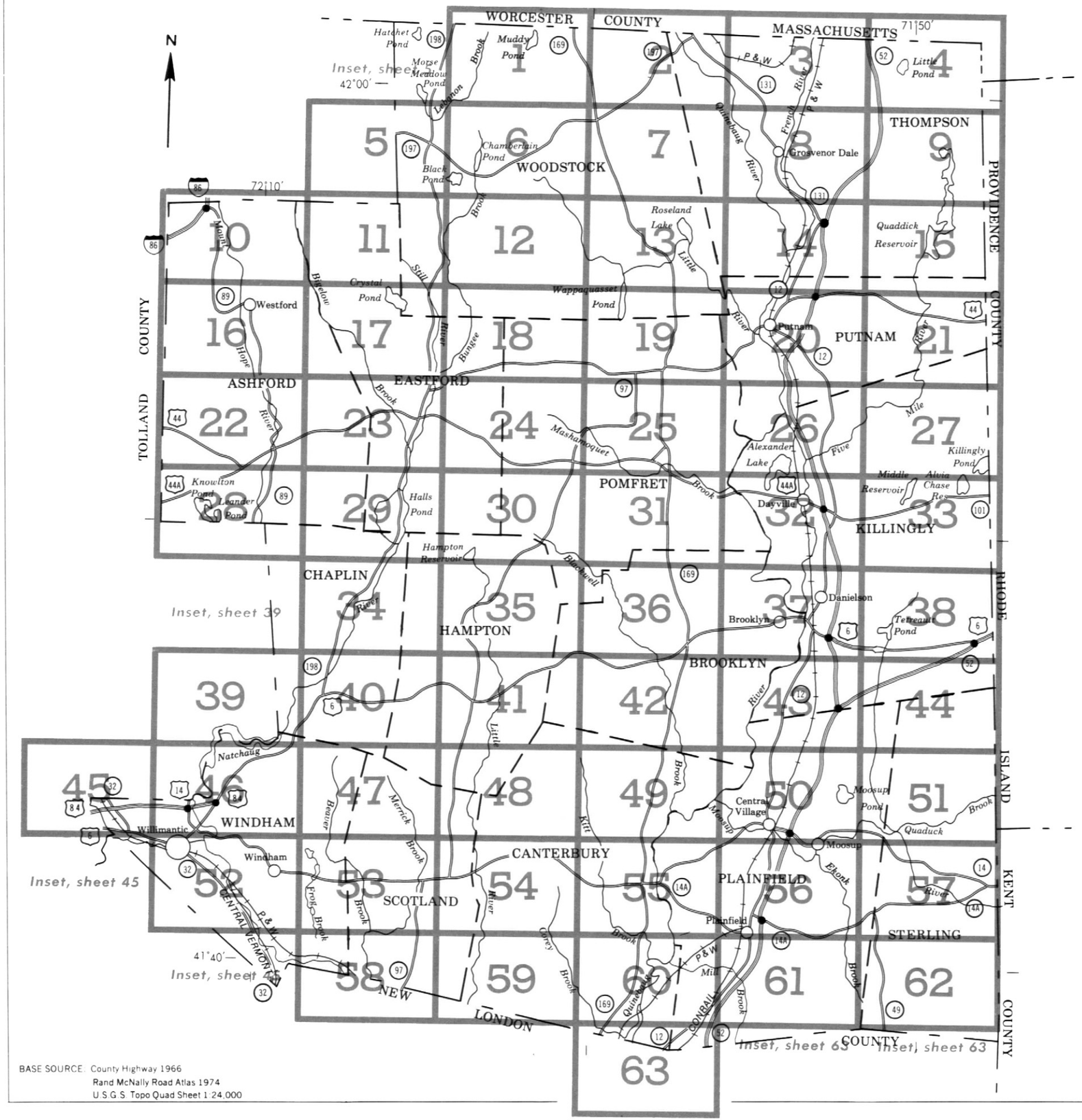
3 Charlton-Canton-Leicester: Nearly level to steep, well drained and poorly drained, loamy soils on broad ridges and hillsides of glacial till uplands

4 Woodbridge-Paxton-Ridgebury: Nearly level to steep, well drained to poorly drained, loamy soils that have a compact substratum; on drumloidal glacial till uplands

5 Hinckley-Merrimac: Nearly level to very steep, excessively drained and somewhat excessively drained, sandy soils on glacial outwash plains and terraces

6 Saco-Rippowam-Pootatuck: Nearly level, moderately well drained to very poorly drained, loamy soils on flood plains

Compiled 1981



BASE SOURCE: County Highway 1966
Rand McNally Road Atlas 1974
U.S.G.S. Topo Quad Sheet 1:24,000

INDEX TO MAP SHEETS

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

WINDHAM COUNTY, CONNECTICUT

Scale 1:190,080

1 0 1 2 3 4 Miles

1 0 1 2 3 4 Kilometers

Original text from each individual map sheet read:

This map is compiled on 1975 and 1976 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

Compiled 1980 1-16490

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool (Davis Airstrip; FLOOD POOL LINE)

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEMS & DESIGNATIONS

- Interstate (78)
- Federal (410)
- State (52)
- County, farm or ranch (378)

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small (water; w)

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) (Indian Mound)
- Located object (label) (Tower)
- Tank (label) (GAS)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) (CANAL)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial (water; w)
- Intermittent (int; i)

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS (CeA; FoB2)

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot

SOIL LEGEND

The first component, always a capital letter is the initial letter of the soil name. The second component is a lower case letter. The third component, the capital letter A, B, C, D, or E is the slope class. Symbols without a letter for slope class are for nearly level soils. A final number, 2, shows that the soil is eroded.

SYMBOL	NAME
Aa	Adrian and Palms mucks
AfA	Agawam fine sandy loam, 0 to 3 percent slopes
AfB	Agawam fine sandy loam, 3 to 8 percent slopes
BkC	Brookfield-Brimfield fine sandy loams, very rocky, 3 to 15 percent slopes
BkD	Brookfield-Brimfield fine sandy loams, very rocky, 15 to 35 percent slopes
CbB	Canton and Charlton fine sandy loams, 3 to 8 percent slopes
CbC	Canton and Charlton fine sandy loams, 8 to 15 percent slopes
CcB	Canton and Charlton very stony fine sandy loams, 3 to 8 percent slopes
CcC	Canton and Charlton very stony fine sandy loams, 8 to 15 percent slopes
CdC	Canton and Charlton extremely stony fine sandy loams, 3 to 15 percent slopes
CdD	Canton and Charlton extremely stony fine sandy loams, 15 to 35 percent slopes
Ce	Carlisle muck
CrC	Charlton-Hollis fine sandy loams, very rocky, 3 to 15 percent slopes
CrD	Charlton-Hollis fine sandy loams, very rocky, 15 to 35 percent slopes
GbB	Gloucester very stony sandy loam, 3 to 8 percent slopes
GbC	Gloucester very stony sandy loam, 8 to 15 percent slopes
GeC	Gloucester extremely stony sandy loam, 3 to 15 percent slopes
GeD	Gloucester extremely stony sandy loam, 15 to 35 percent slopes
HkA	Hinckley gravelly sandy loam, 0 to 3 percent slopes
HkC	Hinckley gravelly sandy loam, 3 to 15 percent slopes
HkD	Hinckley gravelly sandy loam, 15 to 40 percent slopes
HrC	Hollis-Charlton-Rock outcrop complex, 3 to 15 percent slopes
HrD	Hollis-Charlton-Rock outcrop complex, 15 to 35 percent slopes
MyA	Merrimac sandy loamy, 0 to 3 percent slopes
MyB	Merrimac sandy loam, 3 to 8 percent slopes
Nn	Ninigret fine sandy loam
On	Occum fine sandy loam
PbB	Paxton fine sandy loam, 3 to 8 percent slopes
PbC	Paxton fine sandy loam, 8 to 15 percent slopes
PbD	Paxton fine sandy loam, 15 to 25 percent slopes
PdB	Paxton very stony fine sandy loam, 3 to 8 percent slopes
PdC	Paxton very stony fine sandy loam, 8 to 15 percent slopes
PeC	Paxton extremely stony fine sandy loam, 3 to 15 percent slopes
PeD	Paxton extremely stony fine sandy loam, 15 to 35 percent slopes
Pr	Pits, gravel
Ps	Pootatuck fine sandy loam
Rd	Ridgebury fine sandy loam
Rn	Ridgebury, Leicester, and Whitman extremely stony fine sandy loams
Ru	Rippowam fine sandy loam
Sb	Saco silt loam
Sf	Scarboro fine sandy loam
Sg	Sudbury sandy loam
St	Suncook loamy fine sand
SvA	Sutton fine sandy loam, 0 to 3 percent slopes
SvB	Sutton fine sandy loam, 3 to 8 percent slopes
SwA	Sutton very stony fine sandy loam, 0 to 3 percent slopes
SwB	Sutton very stony fine sandy loam, 3 to 8 percent slopes
SxB	Sutton extremely stony fine sandy loam, 3 to 8 percent slopes
Ud	Udorthents, smoothed
Wd	Walpole sandy loam
WvA	Windsor loamy sand, 0 to 3 percent slopes
WvB	Windsor loamy sand, 3 to 8 percent slopes
WxA	Woodbridge fine sandy loam, 0 to 3 percent slopes
WxB	Woodbridge fine sandy loam, 3 to 8 percent slopes
WxC	Woodbridge fine sandy loam, 8 to 15 percent slopes
WyA	Woodbridge very stony fine sandy loam, 0 to 3 percent slopes
WyB	Woodbridge very stony fine sandy loam, 3 to 8 percent slopes
WyC	Woodbridge very stony fine sandy loam, 8 to 15 percent slopes
WzA	Woodbridge extremely stony fine sandy loam, 0 to 3 percent slopes
WzC	Woodbridge extremely stony fine sandy loam, 3 to 15 percent slopes
W	Water

785 000 FEET

435 000 FEET

STATE OF MASSACHUSETTS

MUDDY POND

Sansoucy Pond

Muddy Brook

Sherman Corner

English Neighborhood

water

Potter Pond

Pout Pond

Lebanon Brook

(Joins inset, sheet 5)

(Joins sheet 6)

(Joins sheet 2)

425 000 FEET

800 000 FEET

N

1 Mile

5 000 Feet

Scale 1:15 840

2

N

820 000 FEET

435 000 FEET

STATE OF MASSACHUSETTS

Quinebaug

Fabyan

THOMPSON

WOODSTOCK

CONRAIL

QUINEBAUG RIVER

Muddy Brook

Muddy Brook

1 Mile

5 000 Feet

Scale 1:15 840

0 0

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

5 000

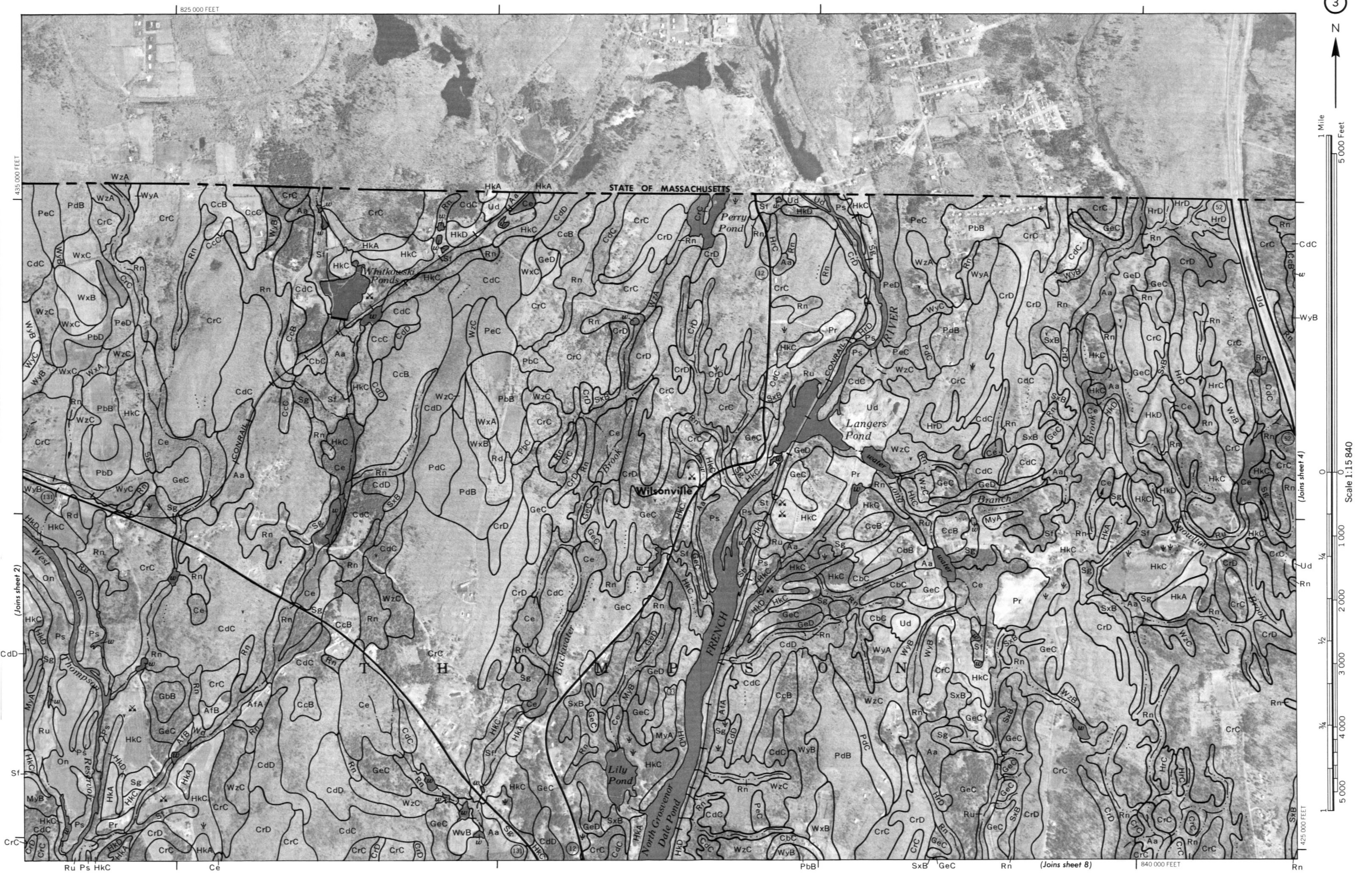
425 000 FEET

805 000 FEET

(Joins sheet 1)

(Joins sheet 3)

(Joins sheet 7)


3
N
825 000 FEET
435 000 FEET
840 000 FEET
425 000 FEET
STATE OF MASSACHUSETTS
Perry Pond
Whitkowski Ponds
CONRAIL
FRENCH RIVER
Langers Pond
Wilsonville
Brook
Backwater
Branch
Knowlton Brook
West Thompson Reservoir
Lily Pond
North Grosvenor Dale Pond
T H O M P S O N
(Joins sheet 2)
(Joins sheet 4)
(Joins sheet 8)
1 Mile
5 000 Feet
Scale 1:15 840

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

860 000 FEET

435 000 FEET

425 000 FEET

845 000 FEET

STATE OF MASSACHUSETTS

STATE OF RHODE ISLAND

Little Pond

JERRY'S SWAMP

Long Pond

FIVEMILE RIVER

Kingsbury Pond

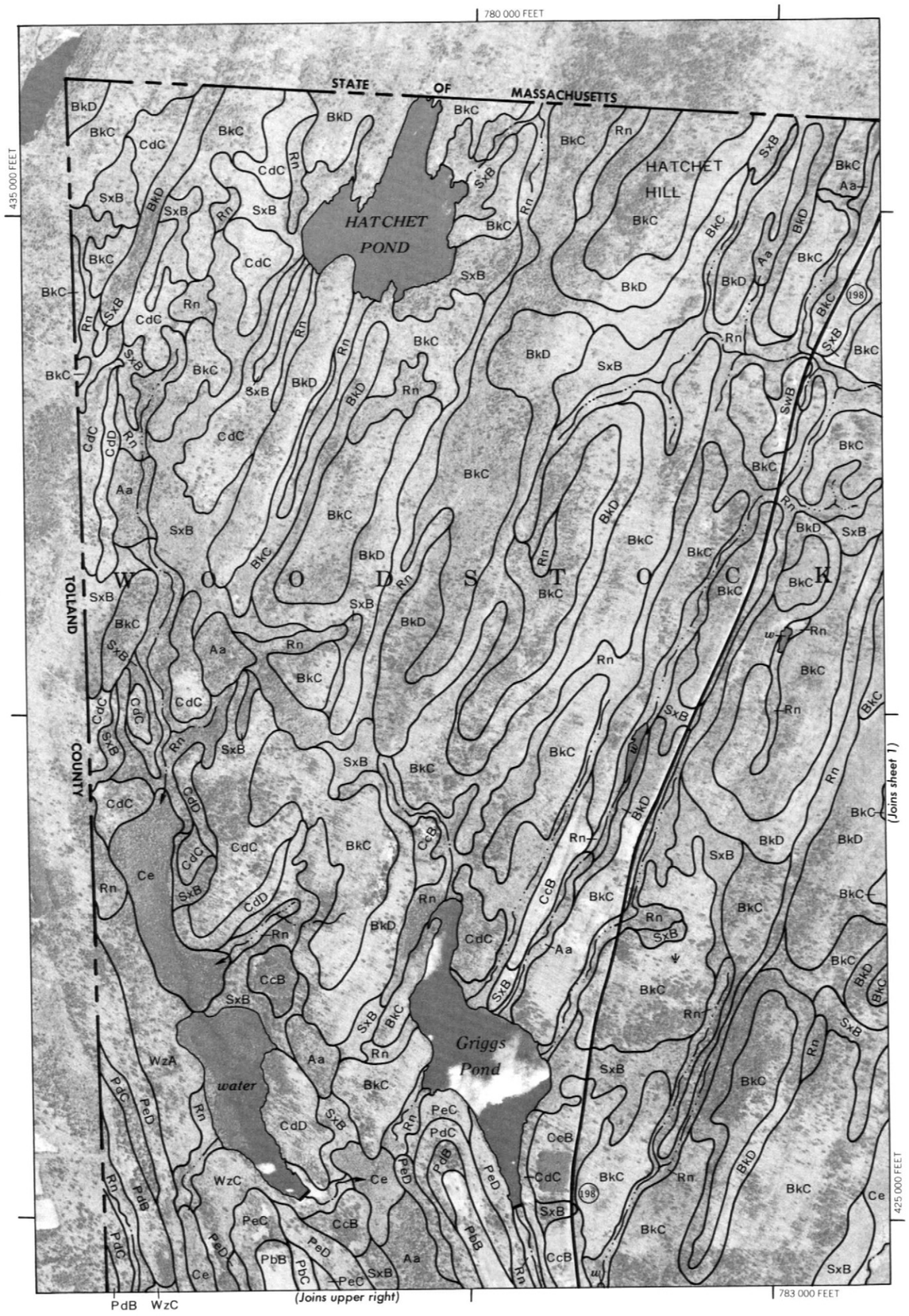
East Thompson

CONRAIL

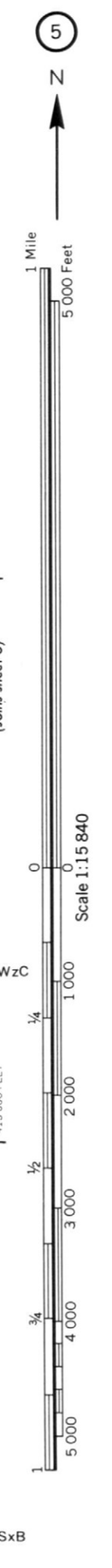
HOPKINTON

(Joins sheet 3)

(Joins sheet 9)


780 000 FEET
435 000 FEET
STATE OF MASSACHUSETTS
HATCHET POND
HATCHET HILL
TOLLAND
COUNTY
WOODSTOCK
Griggs Pond
water
(198)
(Joins sheet 1)
425 000 FEET
PdB WzC
(Joins upper right)
783 000 FEET


(Joins lower left)
780 000 FEET
420 000 FEET
TOLLAND
COUNTY
WOODSTOCK
Lebanon
Brook
Keach Pond
water
(197)
(198)
(Joins sheet 6)
(Joins sheet 11)
783 000 FEET
415 000 FEET
WzC
SxB


5
N
1 Mile
5 000 Feet
Scale 1:15 840
0
1/4
1/2
3/4
1
1 000
2 000
3 000
4 000
5 000

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 1)

(Joins sheet 5)

(Joins sheet 7)

(Joins sheet 12)

800 000 FEET

420 000 FEET

415 000 FEET

785 000 FEET

BLACK POND

CHAMBERLAIN POND

CEDAR SWAMP

Cedar Swamp Pond

Cedar Swamp Br.

BUNGEE HILL

WOODSTOCK

Bungee Brook

Redhead Meadow Brook

Taylor Brook

Gravelly Brook

Neighborhood Brook

Black Brook

English Neighborhood Brook

water

7

N

1 Mile

5 000 Feet

Scale 1:15 840


8
N
(Joins sheet 3)
(Joins sheet 7)
(Joins sheet 9)
(Joins sheet 14)
Scale 1:15 840
1 Mile
5 000 Feet
840 000 FEET
425 000 FEET
415 000 FEET
825 000 FEET
Auger Pond
QUINEBAUG
RIVER
FRENCH
RIVER
North Grosvenor Dale Pond
NORTH GROSVENOR DALE
Grosvenor Dale
Backwater Brook
Baptist Brook
Brook
Ravenel Ponds
West Thompson Lake
BULL HILL
DEPOT HILL
SUNSET HILL
Sunset Hill
T H O M P S O N
CONRAIL
water
Stout
Sunset
Hill

WINDHAM COUNTY, CONNECTICUT SHEET NUMBER 9

9

N

1 Mile

5 000 Feet

Scale 1:15 840

845 000 FEET

860 000 FEET

425 000 FEET

415 000 FEET

(Joins sheet 4)

(Joins sheet 8)

(Joins sheet 15)

CONRAIL

Tanson

Fivemile River

Stump Pond

Whitmans Pond

Brandy Brook

QUADDICK RESERVOIR

BRANDY HILL

THOMPSON

STATE OF RHODE ISLAND

N

760 000 FEET

410 000 FEET

400 000 FEET

745 000 FEET

1 Mile

5 000 Feet

Scale 1:15 840

TOLLAND COUNTY

TOLLAND COUNTY

Morey Pond

Armitage Pond

LAKE CHAFFEE

water

SNOW HILL

SKY HILL

MOUNT

ASHFORD

HOLLOW

BOSTON

TURKEY HILL

Brook

Mine

Bigelow

Paine Pond

Tinkerville

(Joins sheet 16)

(Joins sheet 11)

765 000 FEET

410 000 FEET

(Joins sheet 5)

TOLLAND COUNTY

Morse Reservoir

VINTON HILL

North Ashford

STALLION HILL

EASTFORD

WOODSTOCK

Still

water

Bungee

Pond

Crystal Pond

River

Brook

Kenyonville

(Joins sheet 12)

(Joins sheet 10)

(Joins sheet 17)

780 000 FEET

400 000 FEET

11

N

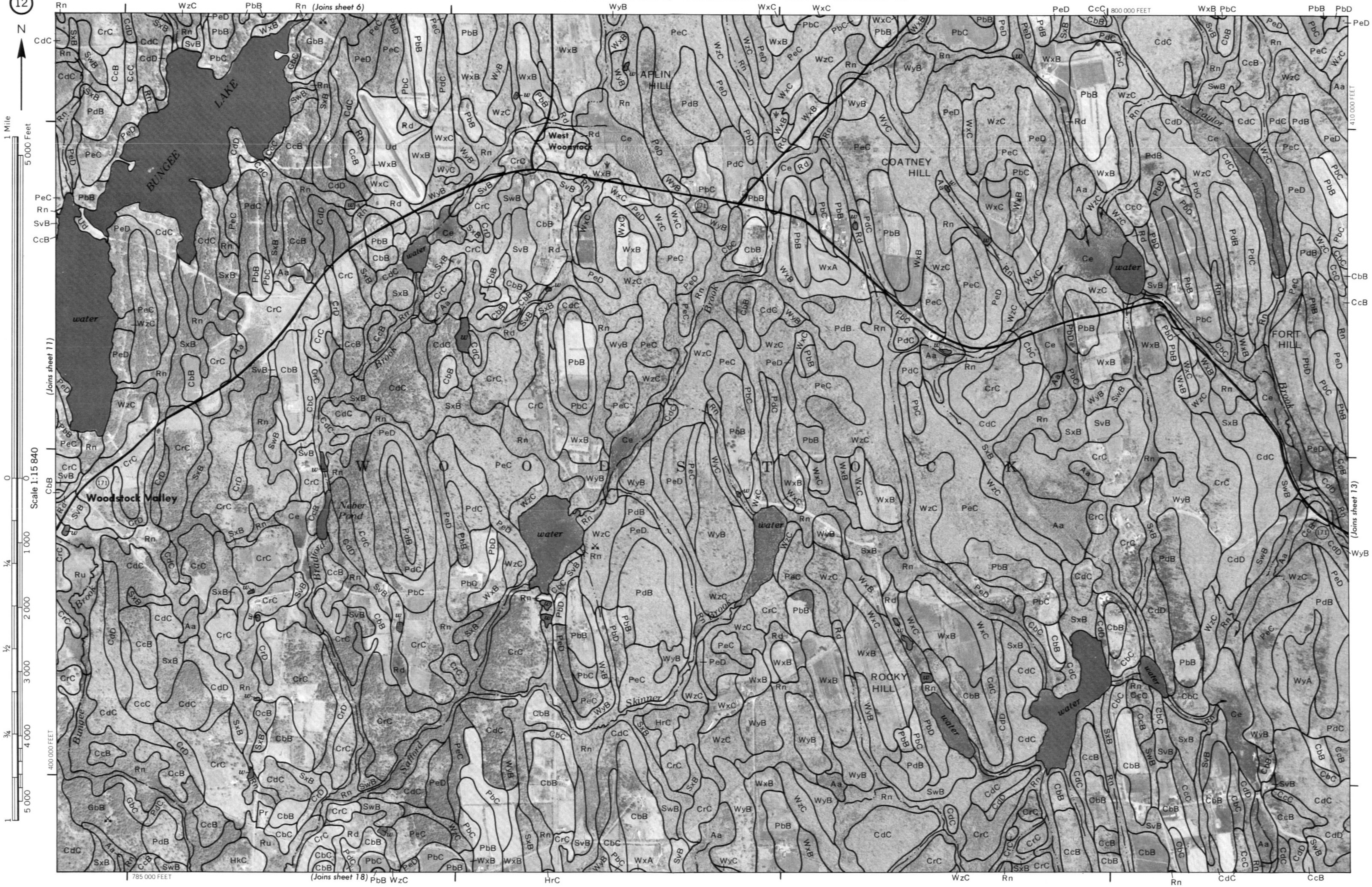
1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000


(Joins sheet 6)
(Joins sheet 11)
(Joins sheet 13)
(Joins sheet 18)
N
1 Mile
5 000 Feet
Scale 1:15 840
0
1 000
¼
2 000
½
3 000
¾
4 000
5 000
800 000 FEET
410 000 FEET
785 000 FEET
400 000 FEET
BUNGEE LAKE
APLIN HILL
West Woodstock
COATNEY HILL
FORT HILL
Taylor
Brook
W O O D S T O C K
Woodstock Valley
Naber Pond
Bradford
Bungee Brook
Stafford
Skinner Brook
ROCKY HILL
water
171

WINDHAM COUNTY, CONNECTICUT SHEET NUMBER 13

13

N

805 000 FEET

820 000 FEET

410 000 FEET

400 000 FEET

(Joins sheet 7)

(Joins sheet 12)

(Joins sheet 14)

(Joins sheet 19)

WOODSTOCK

ROSELAND LAKE

South Woodstock

PUTNAM

WAPPAQUASSET POND

Shepherds Pond

Harrisville

Mill Brook

North Running Brook

Muddy Brook

Little Brook

Little River

water

1 Mile

5 000 Feet

Scale 1:15 840

N

1 Mile

5 000 Feet

Scale 1:15 840

West Thompson Lake

THOMPSON DAM

WEST THOMPSON

RIVER

Thompson

West Thompson

Mechanicsville

Duck Pond

Reams Pond

BATES HILL

BREACH BROOK

Wheatfall Brook

CONRAIL

840 000 FEET

825 000 FEET

410 000 FEET

400 000 FEET

(Joins sheet 8)

(Joins sheet 13)

(Joins sheet 20)

(Joins sheet 15)

(Joins sheet 9)

(Joins sheet 14)

(Joins sheet 21)

845 000 FEET

860 000 FEET

410 000 FEET

400 000 FEET

FORT HILL

QUADDICK RESERVOIR

QUADDICK MOUNTAIN

Lower Pond

Quaddick

Blackmore

Brandy Brook

Five Mile River

ELMWOOD HILL

Beach Brook

STATE OF RHODE ISLAND

TOMPKINS

PUTNAM

ANDOVER

15

N

1 Mile

5 000 Feet

Scale 1:15 840

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 10)

(Joins sheet 15)

(Joins sheet 17)

(Joins sheet 22)

760 000 FEET

395 000 FEET

390 000 FEET

750 000 FEET

TOLLAND COUNTY

Westford

WESTFORD HILL

GRASS HILL

SPOONER HILL

HORSE HILL

Kidder Brook

Mount Hope River

Stowell Pond

Hammond Brook

water


765 000 FEET
395 000 FEET
390 000 FEET
780 000 FEET
(Joins sheet 11)
(Joins sheet 16)
(Joins sheet 18)
(Joins sheet 23)
Crystal Pond
Ashford Lake
Sabo Pond
water
BUELL HILL
SUMMER HILL
THREEMILE HILL
Eastford
ASHFORD
WOODSTOCK
Bigelow Brook
Halls Brook
Sibley Brook
Walker Bk
Warren Brook
Still Ru
Kreen Brook
N
1 Mile
5 000 Feet
Scale 1:15 840
0
¼
½
¾
1
1 000
2 000
3 000
4 000
5 000

18

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 ¼ 1 000 ½ 2 000 ¾ 3 000 1 4 000 5 000

(Joins sheet 12)

(Joins sheet 17)

(Joins sheet 19)

(Joins sheet 24)

800 000 FEET

785 000 FEET

390 000 FEET

395 000 FEET

Bosworth Brook

Bundee Brook

Indian Brook

Hill Brook

Ragged Hill Brook

Nightingale Brook

WOODSTOCK

EASTFORD

RAGGED HILL

PomFRET

DAVEN HILL

SHAW HILL

NIGHTINGALE POND

Inset


805 000 FEET
395 000 FEET
820 000 FEET
390 000 FEET
WAPPAQUASSET POND
WOODSTOCK
PUTNAM
PROSPECT HILL
Pomfret
Harrisville
Little Brook
Peake Brook
Bush Meadow Brook
water
(Joins sheet 13)
(Joins sheet 20)
(Joins sheet 18)
(Joins sheet 25)
N
1 Mile
5 000 Feet
Scale 1:15 840

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 14)

(Joins sheet 19)

(Joins sheet 26)

(Joins sheet 21)

840 000 FEET

395 000 FEET

390 000 FEET

825 000 FEET

PUTNAM

POMFRET

BOWEN HILL

Putnam Heights

QUINEBAUG RIVER

Little River

Little Tavern Brook

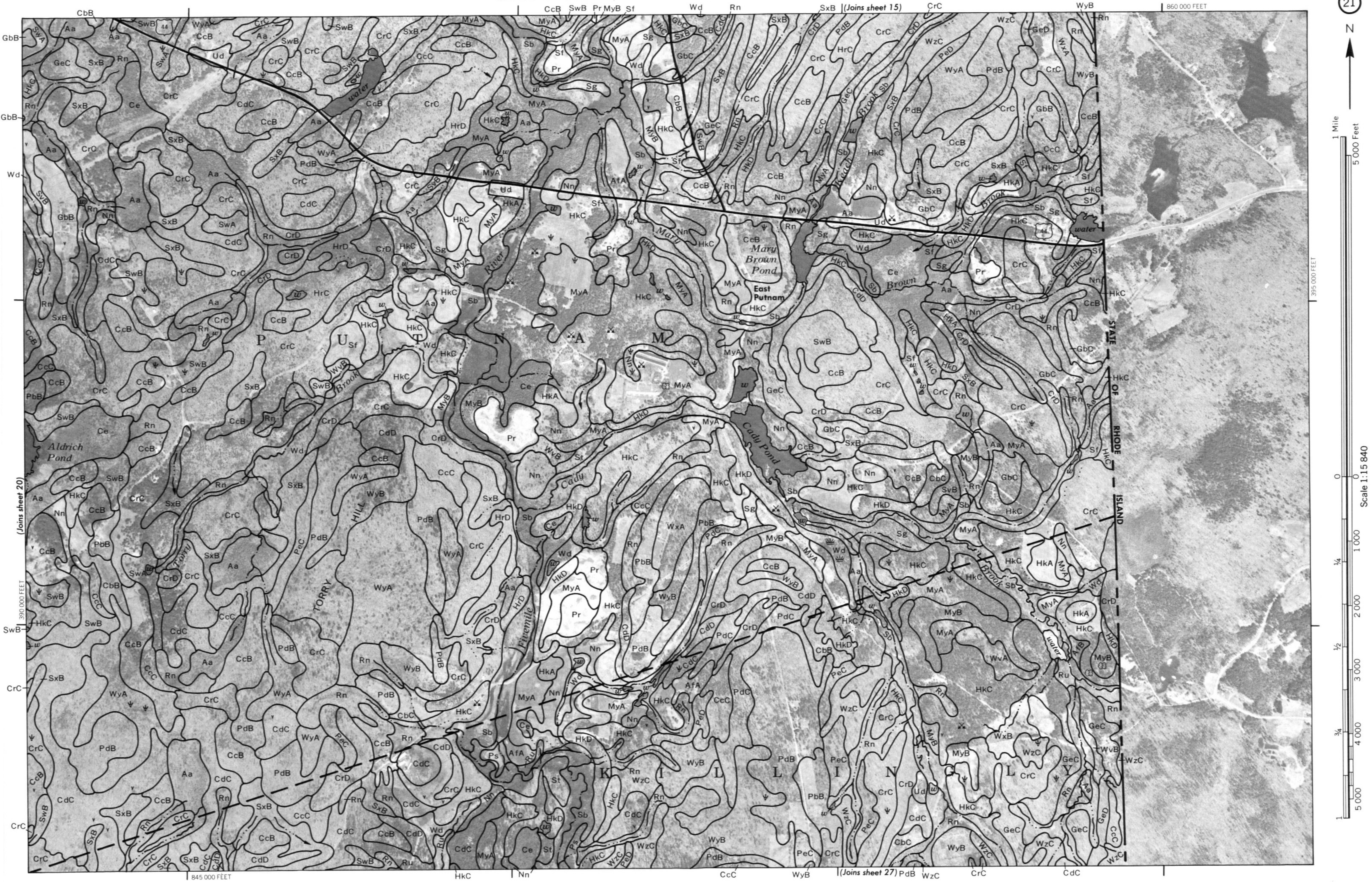
Culver Brook

Carpenter Brook

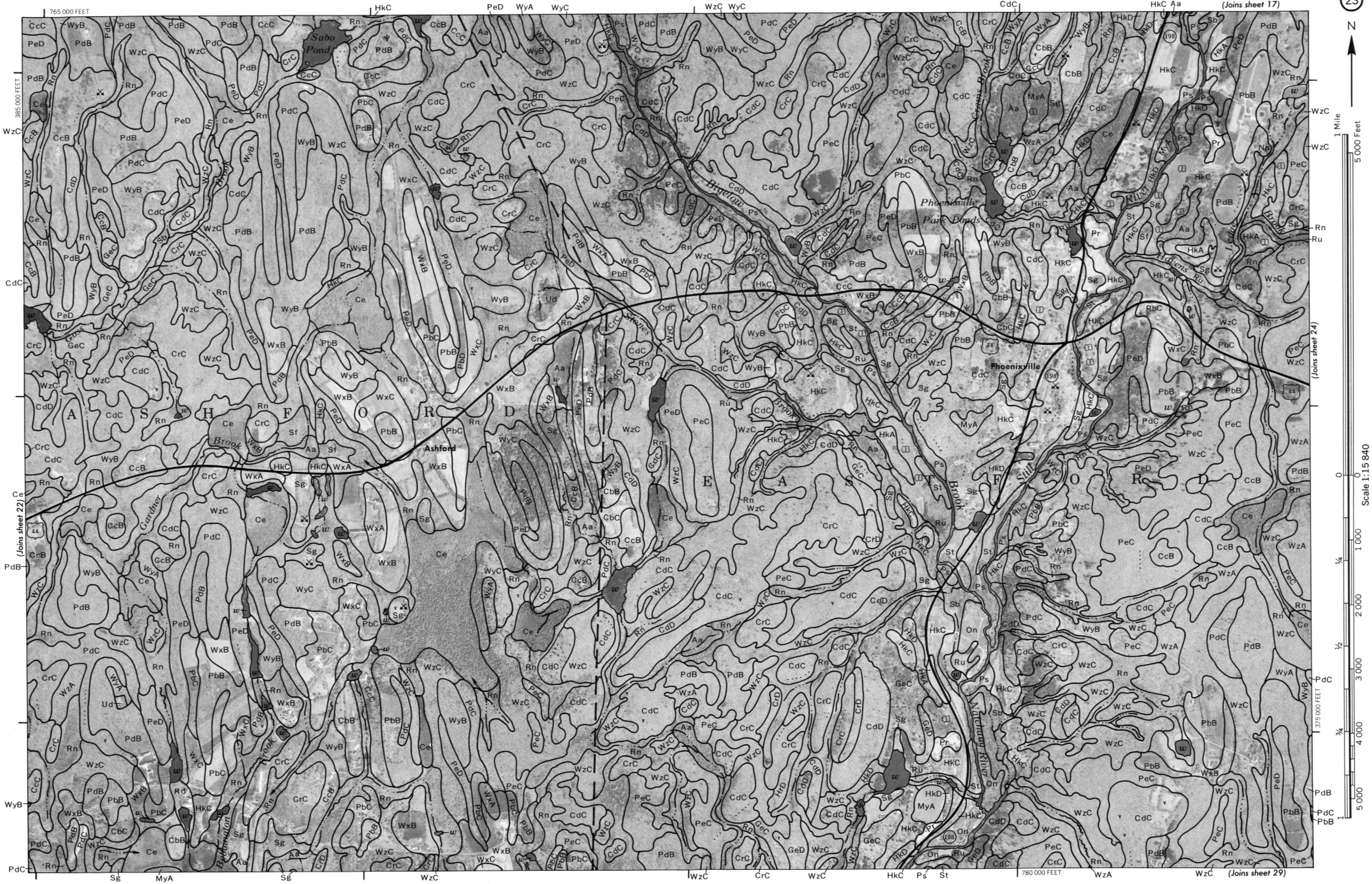
Aldrich Pond

CONRAIL

STATE ST


(Joins sheet 15)
(Joins sheet 20)
(Joins sheet 27)
860 000 FEET
395 000 FEET
390 000 FEET
845 000 FEET
N
PUTNAM
KILLINGLY
TORRY HILL
East Putnam
Mary Brown Pond
Cady Pond
Aldrich Pond
Mary Brown Brook
Brown Brook
Beach Brook
Five Mile River
Cady Brook
Torry Brook
STATE OF RHODE ISLAND
water
1 Mile
5 000 Feet
Scale 1:15 840
0
1/4
1/2
3/4
1
0
1 000
2 000
3 000
4 000
5 000

WINDHAM COUNTY, CONNECTICUT SHEET NUMBER 22


765 000 FEET
385 000 FEET
780 000 FEET
375 000 FEET
(Joins sheet 17)
(Joins sheet 22)
(Joins sheet 24)
(Joins sheet 29)
Sabo Pond
Ashford
Phoenixville
Phoenixville Park Ponds
A S H F O R D
E A S T F O R D
Bigelow Brook
Still River
Natchaug River
Gardner Brook
Bebbington Brook
Stones Brook
Crams Brook
Ledoit Brook
Havens Run
N
1 Mile
5 000 Feet
Scale 1:15 840
0
¼
½
¾
1 000
2 000
3 000
4 000
5 000


24
N
(Joins sheet 18)
(Joins sheet 23)
(Joins sheet 25)
(Joins sheet 30)
800 000 FEET
385 000 FEET
785 000 FEET
375 000 FEET
1 Mile
5 000 Feet
Scale 1:15 840
EASTFORD
POMFRET
PISGAH HILL
LYON HILL
ALLEN HILL
Abington
Ragged Hill Brook
Nightingale Brook
Cemetery Brook
Mashamoquet Brook
Taft Pond
Norton Brook
Lyon Brook
Abington Brook
Ledge Brook
water
44
97


(Joins sheet 19)
(Joins sheet 24)
(Joins sheet 26)
(Joins sheet 31)
805 000 FEET
820 000 FEET
385 000 FEET
375 000 FEET
N
Scale 1:15 840
1 Mile
5 000 Feet
P O M F R E T
Mashamoquet
Kelly Ponds
Wappoquia
Bark Meadow Brook
Day Brook
Abington
Run
water
97
169
44
101

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

840 000 FEET

385 000 FEET

375 000 FEET

825 000 FEET

(Joins sheet 20)

(Joins sheet 25)

(Joins sheet 27)

(Joins sheet 32)

POMFRET

PUTNAM

KILLINGLY

Brook Carpenter Pond

Wheatons Pond

ALEXANDER LAKE

Attawaugan

Ballouville

Carpenter Brook

Quinebaug River

Five Mile River

Attawaugan River

CONRAIL

water

(Joins sheet 21)

(Joins sheet 26)

(Joins sheet 33)

845 000 FEET

860 000 FEET

385 000 FEET

375 000 FEET

Pineville

Rivermile water

Ru water

River

AfA

KENTUCK LEDGES

HORSE HILL

BEAR HILL

CHESTNUT HILL

Eddy Pray Reservoir

Chase Reservoir

KILLINGLY POND

MIDDLE RESERVOIR

STATE OF RHODE ISLAND

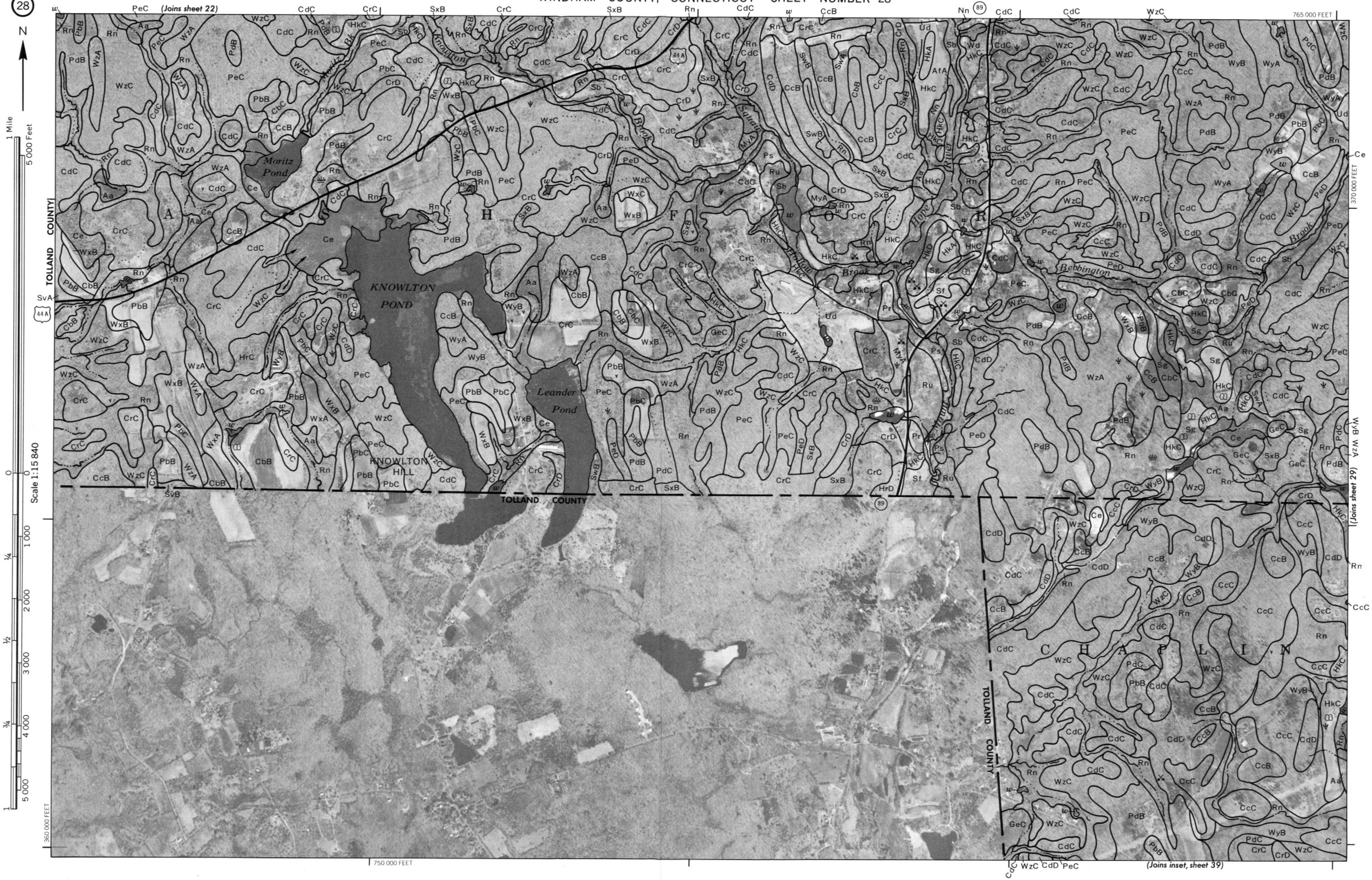
N

27

1 Mile

5 000 Feet

Scale 1:15 840


(Joins sheet 22)
(Joins sheet 29)
(Joins inset, sheet 39)
KNOWLTON POND
Leander Pond
Moritz Pond
KNOWLTON HILL
TOLLAND COUNTY
C H A P L I N
A S H F O R D
765 000 FEET
370 000 FEET
360 000 FEET
750 000 FEET
Scale 1:15 840
1 Mile
5 000 Feet
N


765 000 FEET
370 000 FEET
(Joins sheet 23)
(Joins sheet 28)
(Joins sheet 30)
(Joins sheet 34)
780 000 FEET
360 000 FEET
N
1 Mile
5 000 Feet
Scale 1:15 840
PUMPKIN HILL
A S H F O R D
E A S T F O R D
C H A P L I N
H A M P T O N
Halls Pond
Colts Ponds
Upson Lake
Reeds Pond
water
Bebbington
Stonehouse Bk
Stonehouse
Branch
East
Still River
Bigelow Brook
NATCHAUG RIVER
Goodwin Brook
Cedar Swamp Bk
Brook
198

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

5 000

(Joins sheet 24)

(Joins sheet 29)

(Joins sheet 31)

(Joins sheet 35)

800 000 FEET

370 000 FEET

360 000 FEET

785 000 FEET

MAPLE SWAMP

CATDEN SWAMP

TROWBRIDGE HILL

PAINE HILL

EASTER HILL

Elliotts

Baker Pond

Hampton Reservoir

water

Beaverdam Brook

Wade Brook

Brackwell Brook

EASTFORD

PUTNAM

THOMPSON


805 000 FEET
370 000 FEET
365 000 FEET
820 000 FEET
(Joins sheet 25)
(Joins sheet 30)
(Joins sheet 32)
(Joins sheet 36)
BARRETT RIDGE
Den Brook
Wolf Brook
Barren Brook
Willis Brook
PUTNAM
BROOKLYN
1 Mile
5 000 Feet
Scale 1:15 840
N

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 31)

(Joins sheet 26)

(Joins sheet 33)

(Joins sheet 37)

825 000 FEET

840 000 FEET

365 000FEET

370 000FEET

Alexander Lake

water

DAYVILLE

Rogers

Elmville

Dayville

Whetstone Brook

QUINEBAUG RIVER

FIVEMILE RIVER

Lk

Brook

P O M F R E T

B R O O K L Y N

K I L L I N G L Y

N

845 000 FEET

370 000 FEET

365 000 FEET

860 000 FEET

(Joins sheet 27)

(Joins sheet 32)

(Joins sheet 38)

BREAKNECK HILL

Chase Reservoir

MIDDLE RESERVOIR

East Killingly

Bog Meadow Reservoir

Alvia Chase Reservoir

BEAR HILL

Crystal Pond

MASHENTUCK MOUNTAIN

KILLINGLY

SLATER HILL

Smith Pond

water

STATE OF RHODE ISLAND

Scale 1:15 840

1 Mile

5 000 Feet

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 29)

(Joins inset, sheet 39)

(Joins sheet 35)

(Joins sheet 40)

780 000 FEET

770 000 FEET

360 000 FEET

350 000 FEET

Darling Pond

Chaplin

water

water

Hampton Brook

Goodwin Brook

Whitman Brook

Natchaug River

Turner Brook

Stonehouse Brook

East Branch Stonehouse Brook

SUNSET HILL

CEDAR SWAMP

PINE ACRES LAKE

CHAPLIN

PUTNAM

Fuller

785 000 FEET
360 000 FEET
(Joins sheet 30)
(Joins sheet 34)
(Joins sheet 36)
(Joins sheet 41)
800 000 FEET
350 000 FEET
KIMBALL HILL
SHARPE HILL
ALWORTH HILL
POMFRET
HAMPTON
BROOKLYN
Hampton
Rawson Brook
Fuller Brook
Little River
Harris Brook
Wade Brook
Murphy Brook
Stetson Corner
water
35
N
1 Mile
5 000 Feet
Scale 1:15 840


(Joins sheet 31)
(Joins sheet 35)
(Joins sheet 37)
(Joins sheet 42)
P O M F R E T
B R O O K L Y N
BUSH HILL
GRAY MARE HILL
Brooklyn
water
Blackwell Brook
Sandy Brook
Tatnic Brook
Creamery Brook
Bush Hill Brook
820 000 FEET
805 000 FEET
360 000 FEET
350 000 FEET
N
1 Mile
5 000 Feet
Scale 1:15 840

825 000 FEET

360 000 FEET

(Joins sheet 32)

(Joins sheet 36)

(Joins sheet 38)

(Joins sheet 43)

840 000 FEET

350 000 FEET

37

N

1 Mile

5 000 Feet

Scale 1:15 840

QUINEBAUG

Fivemile Pond

DANIELSON

CONRAIL

EAST BROOKLYN

QUEBEC

RIVER

Brook

Pond

Brook

Fall

BROOKLYN

KILLINGLY

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 33)

(Joins sheet 37)

(Joins sheet 44)

860 000 FEET

360 000 FEET

350 000 FEET

845 000 FEET

K I L L I N G L Y

STATE OF RHODE ISLAND

Masheruant

Tetreault Pond

Smith Pond

Salisbury

South Killingly

Tyllis Brook

Meadow Brook

Quadrick

water

760 000 FEET

755 000 FEET

360 000 FEET

345 000 FEET

350 000 FEET

335 000 FEET

765 000 FEET

(Joins sheet 28)

(Joins lower left)

(Joins sheet 34)

(Joins sheet 40)

(Joins upper right)

(Joins sheet 46)

C H A P L I N

TOLLAND COUNTY

Bedlam Corner

Stonehouse Brook

Mansfield Hollow Dam

Natchaug River

Mansure Pond

water

N

1 Mile

5 000 Feet

Scale 1:15 840


40
N
(Joins sheet 34)
(Joins sheet 39)
(Joins sheet 41)
(Joins sheet 47)
780 000 FEET
770 000 FEET
345 000 FEET
335 000 FEET
PINE ACRES LAKE
BARE HILL
South Chaplin
Sherman Corner
Clarks Corner
NATCHAUG RIVER
Buttonball
Brook
Merrick Brook
CCB Swamp
Tucker Pond
Lynch Pond
BEAVER HILL
C H A P L I N
H A M P T O N
W I N D H A M
1 Mile
5 000 Feet
Scale 1:15 840

N

785 000 FEET

345 000 FEET

(Joins sheet 35)

(Joins sheet 42)

(Joins sheet 40)

(Joins sheet 48)

800 000 FEET

1 Mile

5 000 Feet

Scale 1:15 840

0 1 000 2 000 3 000 4 000 5 000

335 000 FEET

Cedar Swamp

Murphy Brook

Little River

HOWARD VALLEY

SHAW HILL

HAMPTON

BROOKLYN

CANTERBURY

42

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 ¼ 1 000 ½ 2 000 ¾ 4 000 1 5 000

335 000 FEET

345 000 FEET

820 000 FEET

805 000 FEET

(Joins sheet 36)

(Joins sheet 41)

(Joins sheet 43)

(Joins sheet 49)

BROOKLYN

CANTERBURY

TATNIC HILL

Bassel Pond Brook

Blackwing Brook

Crampton Brook

Hollow Brook

Tatnic Brook

Pine Brook

water

Stoney

N

1 Mile
5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000 5 840

825 000 FEET

345 000 FEET

335 000 FEET

840 000 FEET

BROOKLYN

ALLEN HILL

QUINEBAUG RIVER

Quinebaug Pond

KILLINGLY

HALF HILL

PLAINFIELD

West Wauregan

Pine Brook

Quinebaug Brook

James Brook

Meadow Brook

Apple Tree Brook

CONRAIL

(Joins sheet 37)

(Joins sheet 42)

(Joins sheet 44)

(Joins sheet 50)

44

N

1 Mile

5 000 Feet

Scale 1:15 840

860 000 FEET

345 000 FEET

335 000 FEET

845 000 FEET

(Joins sheet 43)

(Joins sheet 38)

(Joins sheet 51)

PLAINFIELD

KILLINGLY

STERLING

STATE OF RHODE ISLAND

Norton Brook

Meadow Brook

Snake Meadow Pond

Tennant Brook

Snake Brook

Wood Brook

Titus Brook

Rounds Brook

Quandick Brook

water

WINDHAM COUNTY, CONNECTICUT SHEET NUMBER 45

46

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

765 000 FEET

330 000 FEET

325 000 FEET

750 000 FEET

(Joins sheet 39)

(Joins sheet 45)

(Joins sheet 47)

(Joins sheet 52)

TOLLAND COUNTY

WILLIMANTIC RESERVOIR

MANSFIELD HOLLOW DAM

WILLIMANTIC RIVER

Natchaug

Polish Brook

Cheshaul Hill Brook

Ballimonquet Brook

WILLIMANTIC

MANSFIELD

47

N

1 Mile

5 000 Feet

Scale 1:15 840

770 000 FEET

780 000 FEET

330 000 FEET

325 000 FEET

(Joins sheet 40)

(Joins sheet 48)

(Joins sheet 46)

(Joins sheet 53)

CHAPLIN

WINDHAM

SCOTLAND

MANSFIELD

BEAVER HILL PeC

PARRISH HILL CbB

Bibbons Pond

Beaver Brook

Bullymuck Bk

Merrick Brook

Kimball Pond Brook

water


N
(Joins sheet 41)
(Joins sheet 47)
(Joins sheet 49)
(Joins sheet 54)
800 000 FEET
785 000 FEET
330 000 FEET
325 000 FEET
1 Mile
5 000 Feet
Scale 1:15 840
HAMPTON
SCOTLAND
CANTERBURY
PUDDING HILL
Wright Pond
Little River
Burnham Brook
Downing Brook
Cold Spring Brook
Rowland Brook
97

(Joins sheet 42)

(Joins sheet 48)

(Joins sheet 50)

(Joins sheet 55)

805 000 FEET

820 000 FEET

330 000 FEET

325 000 FEET

BUCK HILL

CANTERBURY

BROOKLYN

PLAINFIELD

QUINEBAUG RIVER

Tatnic Brook

Kittl Brook

Durbin Brook

Blackwell Brook

Sugar Brook

water

49

N

1 Mile

5 000 Feet

Scale 1:15 840

50

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

840 000 FEET

335 000 FEET

325 000 FEET

825 000 FEET

(Joins sheet 43)

(Joins sheet 49)

(Joins sheet 51)

(Joins sheet 56)

BROOKLYN

CANTERBURY

PLAINFIELD

EASTFIELD

Wauregan

SHEPHERD HILL

CENTRAL VILLAGE

MOOSUP

WHITNEY HILL

Almyville

MOOSUP POND

QUINEBAUG River

Moosup River

Tree Meadow Brook

Attawaugan Brook

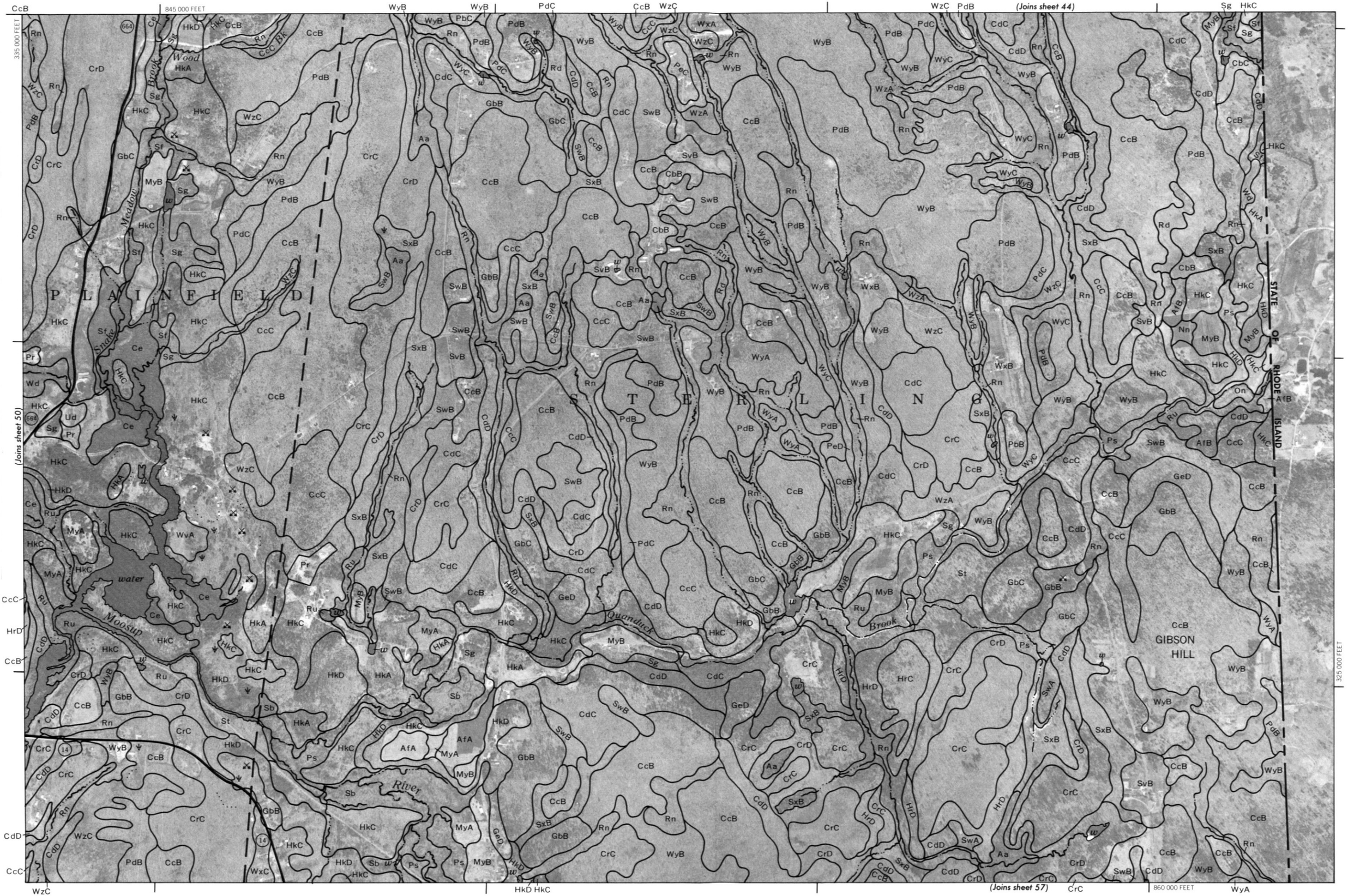
Apple Valley Brook

Taylor Brook

CONRAIL

water

WINDHAM COUNTY, CONNECTICUT SHEET NUMBER 51



N

Scale 1:15 840

1 Mile

5 000 Feet

WILLIMANTIC

MILLER HILL

SHETUCKET RIVER

WILLIMANTIC RIVER

Lymans Pond

Wetherbee Pond

water

Potash

Windham

MULLEN HILL

OBWEBETUCK HILL

South Windham

Jordan Brook

Obwebetuck Brook

Larrabee Brook

NEW LONDON COUNTY

CONRAIL

765 000 FEET

320 000 FEET

310 000 FEET

750 000 FEET

(Joins sheet 46)

(Joins inset B, sheet 45)

(Joins sheet 53)

(Joins inset A, sheet 45)

N

1 Mile

5 000 Feet

Scale 1:15 840

320 000 FEET

770 000 FEET

310 000 FEET

785 000 FEET

(Joins sheet 47)

(Joins sheet 52)

(Joins sheet 54)

(Joins sheet 58)

Lake Marie

Beaver Brook

Frog Pond

Porters Brook

water

Indian Hollow Pond

Merrick Brook

Scotland

WINDHAM

SCOTLAND

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 48)

(Joins sheet 53)

(Joins sheet 55)

(Joins sheet 59)

800 000 FEET

320 000 FEET

310 000 FEET

785 000 FEET

WESTMINSTER HILL

Westminster

CANTERBURY

SCOTLAND

Little River

Fort Ned Pond

Moosup Brook

Quaddick Reservoir

Colburn Brook

Bennett Brook

Deane Brook

Corn Brook

(Joins sheet 49)

(Joins sheet 56)

(Joins sheet 54)

(Joins sheet 60)

Canterbury

BLACK HILL

PLAINFIELD

CEDAR SWAMP

QUINEBAUG RIVER

Bennetts Pond

Bennett Brook

Kill Brook

Palmer Brook

Mudhole Brook

Sugar Ru

Bk

805 000 FEET

320 000 FEET

310 000 FEET

820 000 FEET

55

N

1 Mile

5 000 Feet

Scale 1:15 840

56

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 55)

(Joins sheet 50)

(Joins sheet 57)

(Joins sheet 61)

840 000 FEET

320 000 FEET

310 000 FEET

825 000 FEET

MOOSUP

PLAINFIELD

HOPKINS HILL

Moosup River

CONRAIL

Cedar Swamp

water

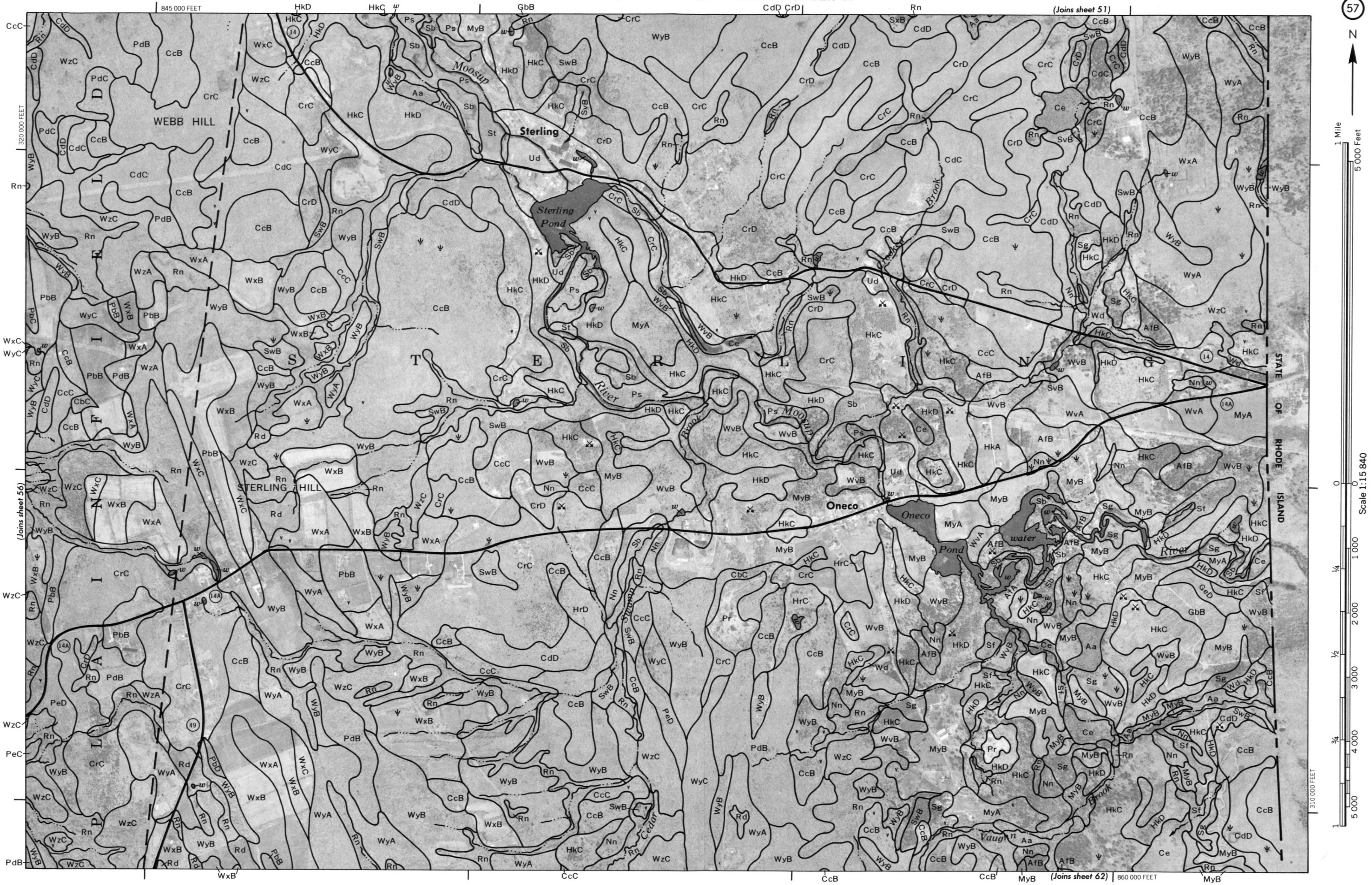
Brook

Brook

Brook

Brook

PLAINFIELD


57
N
845 000 FEET
860 000 FEET
320 000 FEET
310 000 FEET
(Joins sheet 51)
(Joins sheet 56)
(Joins sheet 62)
STATE OF RHODE ISLAND
WEBB HILL
STERLING HILL
Sterling
Oneco
Sterling Pond
Oneco Pond
water
Moosup River
Moosup
Cedar Swamp Brook
Vaughn Brook
PLAINFIELD
STERLING
1 Mile
5 000 Feet
Scale 1:15 840
0
1000
2000
3000
4000
5000
¼
½
¾
1

58

N

1 Mile

5 000 Feet

Scale 1:15 840

1 5 000 ½ 2 500 0 0 ¼ 1 000 ½ 2 000 ¾ 3 000 1 4 000

785 000 FEET

305 000 FEET

300 000 FEET

770 000 FEET

(Joins sheet 53)

(Joins inset A, sheet 45)

(Joins sheet 59)

WINDHAM

SCOTLAND

SHETUCKET RIVER

CONRAIL

NEW LONDON COUNTY

Brook

Merrick

Waldo

AfA

N

785 000 FEET

305 000 FEET

800 000 FEET

300 000 FEET

(Joins sheet 54)

(Joins sheet 58)

(Joins sheet 60)

WOODCHUCK HILL

SCOTLAND

CANTERBURY

NEW LONDON COUNTY

Bates Pond

water

Brook

Little

Scale 1:15 840

1 Mile

5 000 Feet

60

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

5 000

820 000 FEET

305 000 FEET

300 000 FEET

805 000 FEET

(Joins sheet 55)

(Joins sheet 59)

(Joins sheet 61)

(Joins sheet 63)

CANTERBURY

PLAINFIELD

RIVER

Packer

CONRAIL

Packers Pond

Mill Brook

QUINEBAUG

Brook

water

Ce Mill Brook HkC MyB

61

N

1 Mile

5 000 Feet

Scale 1:15 840

1 0 1/4 1 000 1/2 2 000 3/4 3 000 1 4 000 5 000

N

1 Mile 5 000 Feet

Scale 1:15 840

1 0 ¼ ½ ¾ 1

845 000 FEET 860 000 FEET 300 000 FEET 305 000 FEET

(Joins sheet 57)

(Joins sheet 61)

(Joins inset B, sheet 63)

STATE OF RHODE ISLAND

PLAINFIELD

PINE HILL

SCITUATE

FOSTER

NEW LONDON COUNTY

Stanton Pond

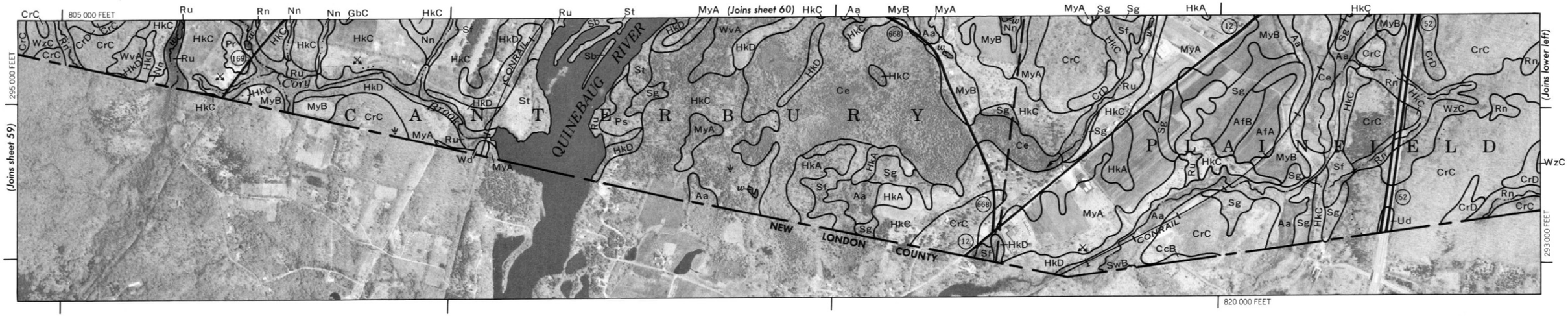
CEDAR SWAMP

Porter Pond

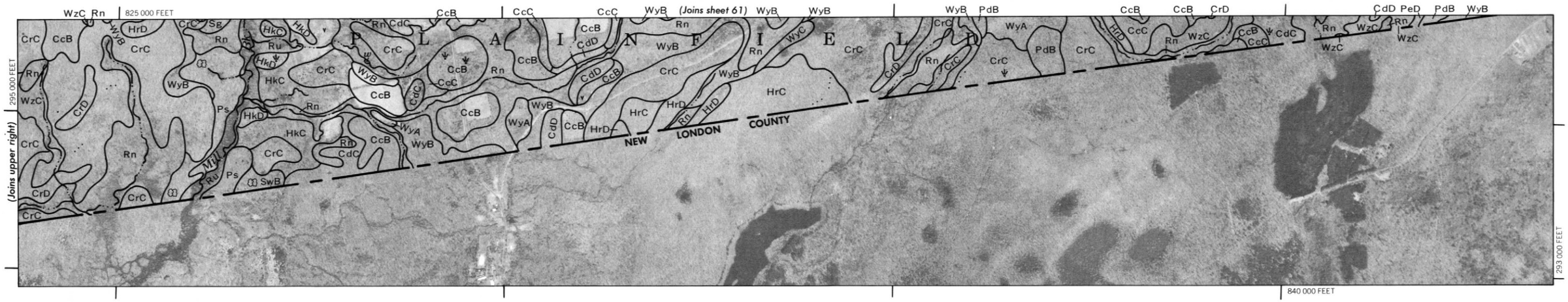
Ponaugansett Brook

Carson Brook

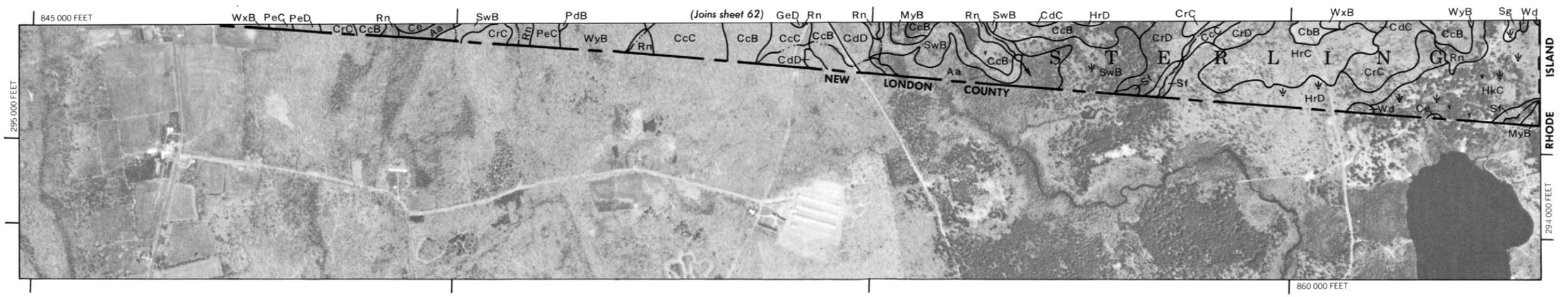
Broad Brook



INSET A



INSET B



N

1 Mile 5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000